

Railway Age

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The Proof of the Pudding on Single Track

THE best evidence of the economic value of any railroad facility is the fact that new installations are being made extensively in different parts of the country. Such is the case with automatic block signaling on busy single-track lines. Within one week recently news was received of contracts for complete divisional installations of automatic signals on single track totaling 426 miles on three different roads as follows: the Norfolk & Western, 122 miles; the Missouri Pacific, 165 miles; and the Seaboard Air Line, 139 miles. On each of these three roads extensive installations of about 200 miles of single-track signaling are now nearing completion or have been placed in service within the last year. In other words, the decision at this time to proceed with further extensive installations must have been based on satisfactory results obtained by signaling on the divisions so equipped previously. Of the more than 218,000 miles of single-track road in the United States only about 22,500 miles are equipped with automatic signals. Many single-track divisions on branch lines do not now, and may never, have sufficient traffic to justify signals. However, within recent years many divisions have been required to handle a rapidly increasing traffic, and the desired increase in track capacity is being secured in numerous cases by installing signals.

Shop Schedule Assists More Than One Department

WHILE a shop schedule for the orderly routing of work through locomotive or car repair shops helps the mechanical department primarily, the fact is that when properly developed, it is of material benefit to other departments. The mechanical department is enabled to make a better showing by reducing shop expense, but the stores department is also assisted by the receipt of accurate advance information regarding the materials needed for repairs, which permits carrying a smaller stock without the danger of a shortage of any necessary material. Likewise, the operating department is assisted by the more prompt return of locomotives and cars to revenue service due to the shorter length of time spent in repair shops. In a recent paper before the Pacific Railway Club, H. C. Venter, shop superintendent of the Southern Pacific, Sacramento, Cal., showed that the installation of a shop schedule at the Sacramento shops in 1924 decreased the average number of working days per Class 2 locomotive in the shop 24 per cent as compared with the 1923 figure. This applied to heavy power receiving new fire-boxes in addition to heavy repairs to machinery. A slightly smaller

percentage reduction was made in 1925, but this was because five of the locomotives given Class 2 repairs were of the Mallet type, involving practically as much machinery as on ten non-articulated locomotives. In the car department at Sacramento, the number of days required per car for all general repair passenger cars was decreased 31 per cent by the installation of an effective schedule system. Railroad shop men can still be found who say that the only advocates of shop schedules are those responsible for their installation, who therefore are naturally disposed to be prejudiced in their favor. The facts speak for themselves, however, as can be determined by a study of the figures at any number of railroad shops where schedules are constantly proving their practical merit and value.

Seniority and Selection

FEW problems in railroad organization have caused more discussion pro and con than that of seniority. It has become more or less firmly entrenched in some classes of service. Regardless, therefore, of its merits or shortcomings, it must be given the gravest consideration when selecting new employees. If a poor selection is made and the candidate is kept on after the period of probation, there is in most cases little if any possibility of a change being made, except for gross inefficiency or a serious offense. Carelessness in selecting an employee and in studying his personality and work critically during the period of probation may thus saddle the railroad indefinitely with an inefficient worker, a continuing expense desulting which will mount up as the year's pass by. Do those who are charged with the responsibility of hiring men fully recognize this? Does not the seriousness of the problem warrant greater consideration than is ordinarily given to it?

Railways Saying Little at Bus and Truck Hearings

THE railways are depending upon their replies to the questionnaire of the Interstate Commerce Commission in its bus and truck transportation investigation, rather than upon oral testimony at the various hearings now being held, to present their side of the case. This has been shown at the hearings that have already been held at Chicago, St. Paul, Minn., and Portland, Ore. Even at the latter two cities, the headquarters of two railways which are respectively the largest and the oldest railway bus operators, nothing was said about the results that have been secured by these lines in their expansion to the highways. At Chicago several railway officers did appear and testify

but their testimony was brief. If it were not for the attendance as listeners of so many railway officers at all the hearings, the railways might be accused of lack of interest in the hearings. It is, of course, true that the questionnaire of the commission is extremely comprehensive and the replies to it by the railways will present the facts with respect to the place occupied as carriers of freight and passengers by the trucks and buses, and facts, rather than arguments, are what the commission wants in the present investigation. Probably their replies to the questionnaire are their best possible witnesses. But it should not be overlooked that the public opinion which is being formed as a result of the wide publicity given the testimony at the commission hearings, will have considerable weight in the consideration by Congress of future legislation effecting the regulation of the highway carriers. In view of this fact the publicity given the testimony at the hearings is of importance to the railways if they feel sincerely that regulation of common carrier motor vehicles is necessary. Their replies to the commission's questionnaire will present the facts that the commission wants but they will not get the railways' reasons in favor of regulation before the public. On the contrary, all of the publicity is being secured by the bus and truck interests and by the shippers who have been rallied to the hearings by the motor vehicle manufacturers and who have been virtually unanimous in testifying that they do not favor regulation of the motor truck as a freight carrier. The only side that the public is hearing is the bus and truck side. This condition scarcely seems desirable from the railway standpoint.

Senator Cummins' Death May Affect Consolidation Legislation

WITH the passing of Albert Baird Cummins, the acknowledged leader in matters pertaining to railroad legislation in the Senate ever since he became chairman of the committee on interstate commerce succeeding the late Senator Newlands, it is likely that very little more will be heard of his railroad consolidation bill, which was intended to apply all the governmental pressure possible, short of absolute direct compulsion, to bring about a more or less artificial standardization of railroad systems. Without his influence Congressional discussion of the subject hereafter is likely to center around the Parker bill, which has been approved by the Interstate Commerce Commission and in a general way by President Coolidge, and which is designed to make possible a certain amount of consolidation along more natural lines without the restrictions of a pre-formulated general plan. Although Senator Cummins was not chairman of the committee on interstate commerce during the last two sessions of Congress, and had transferred much of his activity to the judiciary committee, his colleagues on the commerce committee had allowed him practically a free hand in the drafting, revision and reporting of his consolidation bill with the sanction of the committee and it was not until rather late in the session that the more practical ideas represented in the Parker bill were given an opportunity for much consideration, through the medium of the hearings held before the House committee. With the death of Senator Cummins the Senate loses a large part of its knowledge and understanding of the so-called "railroad problem" and there will be a further subtraction if Smith Wildman Brookhart brings

back to it his store of misinformation. Senator Cummins had always been especially interested in railroad regulation and in recent years has had more to do with the shaping of federal legislation on that subject than almost any other man. He not only was largely responsible for the chief features of the transportation act, which, in spite of the fact that some of them have not been conspicuously working since 1920, were intended to be constructive, but he has also been a potent influence in the Senate in defending the law against attacks having for their purpose its destructive mutilation. In his latest efforts to improve upon it, however, Senator Cummins had sought to introduce additional elements of artificiality into our regulative system through his proposed amendments to the consolidation provisions of the law, and as long as his colleagues were so inclined to leave the matter to him it was difficult to gain the attention of the Senate for the ideas of others on the subject.

A Vital Problem of American Business

THE most important news being published regarding developments affecting the economic welfare of the people of the United States is that showing the increases that are occurring in the percentage of net return earned by the railways on their property investment. It is the most important current economic news because it increases the probability that the railways will be able to continue to give their present good and adequate freight service. The maintenance of that service is one of the most vital problems of American business.

The net return being earned by the railways as a whole is large only by comparison with that earned in other years since their return to private operation. It amounted in the first six months of this year to the annual rate of 4.94 per cent on their property investment. In the year 1921 it was 3.07 per cent; in 1922, 3.83 per cent; in 1923, 4.66 per cent; in 1924, 4.54 per cent; in 1925, 4.83 per cent; the average for these years being, roughly, 4.2 per cent. The year 1926 is one of general prosperity and record-breaking freight traffic. The return being earned is substantially less than in similar years before the war, such as 1910, when it was 5.53 per cent; 1916, when it was 6.16 per cent, and 1917, when it was 5.26 per cent. Measured in the pre-war value of money, the return being earned is much less than before the war. The encouraging feature of the situation is that it is increasing.

Because of developments that have occurred within recent years it should be practicable to convince the public that owing to the effects it is bound to have upon transportation service a continuance of the increase in railway net return until it not only equals but exceeds pre-war levels would contribute more to the public welfare than any other development which could occur in the field of business.

What is the most important change which has occurred in the United States since the war affecting all industry and business? If that question were put to all the leaders in industry, business and finance, and they should consider it carefully, practically all would answer that the most important change that has occurred is the improvement in railway freight service. Car shortages have been so far eliminated that, excepting in occasional

sporadic instances, the railways are furnishing to shippers 100 per cent of the cars for which they ask when and where they want them. Cars loaded with freight are being moved from origin to destination in two-thirds of the time taken six years ago. Regularity and dependability of freight deliveries have been phenomenally increased.

This revolutionary improvement in freight service, it has been repeatedly pointed out by business and financial leaders, has been the principal cause of a momentous revolution in policies followed in every branch of industry and commerce. Enormous losses were incurred by innumerable concerns in the period of deflation beginning in 1920 due to declines in the prices of large stocks of goods that had been accumulated during the preceding period of inflation. Chastened and warned by this experience, they adopted a policy of reducing their inventories and of buying from "hand to mouth." Freight traffic greatly declined during the depression, and this rendered it possible for the railways at that time to handle traffic better, which encouraged a continuance of "hand to mouth" buying. There were traffic congestions and car shortages late in 1922 and early in 1923, but the railways started an unprecedented campaign to improve and enlarge their properties by large capital expenditures, and also for better co-operation between themselves, and between them and the shippers, to bring about better distribution of cars and more speedy movement of them. This campaign was highly successful from its inception.

The result has been that for more than three years car shortages have been virtually unknown, the movement of freight has been steadily accelerated and business concerns have been thereby encouraged steadily to reduce their inventories and to rely upon the railways to bring them fuel, raw materials and manufactured articles as fast as needed to replace those consumed or sold. In consequence, commercial agencies and other students of business conditions continue to report, even in the present period of great manufacturing and mercantile activity, that consumption is keeping pace with production and that there is no apparent tendency for large inventories to accumulate.

The annual value to the business interests and people of the country of the improved railway service is known to be enormous, although it cannot be estimated with any accuracy. Secretary of Commerce Hoover once said, alluding to the car shortages the last of which occurred in 1922, "There would be no difficulty whatever, by basing such losses on the experiences we have already had, to calculate a loss to the American people of a billion dollars from each of these periodic transportation shortages." Julius H. Barnes, a large exporter of grain, and at that time president of the Chamber of Commerce of the United States, said in an address in October, 1922, that because of the transportation shortages then existing, "we have today four billion bushels of grain in the west, the value of which to the farmer in every market in the west is at least ten cents per bushel below the proper relation with the European consumer markets. * * * I don't need to tell you business men what the loss of \$400,000,000 of enlarged spending power to the grain farmers alone would mean to other industries in this country."

These statements referred only to losses inflicted upon the public by shortages of transportation. Regarding the reduction in inventories that improved railway service has made possible, one of the largest lumber manufacturers has estimated that in the lumber industry alone it has been \$600,000,000, and has pointed out that if in other

lines of business it has been in proportion it has totaled \$7,000,000,000. The cost of carrying inventories includes much more than interest on the investment. It includes also the cost of storage, insurance, handling, depreciation, obsolescence, etc. R. M. Hudson, of the United States Department of Commerce, in an address before the Railway Accounting Officers' Association in 1925, estimated the annual cost of carrying stocks at 25 per cent of their value. U. K. Hall, general supervisor of stores of the Union Pacific, in a recent address before the Purchases and Stores division of the American Railway Association, estimated the annual cost of carrying railway stores at 15 per cent of their value. The cost to a railway is no doubt relatively much less than, for example, to a drygoods merchant, because of the much less ephemeral and perishable nature of railroad stores. If the total reduction in all inventories in the country has been seven billion dollars, which business men and economists who have studied the subject probably would consider a conservative estimate, and the saving resulting be calculated as low as 15 per cent annually, the total saving due to it is in excess of a billion dollars a year.

If the various estimates that have been made regarding the widely different effects produced upon general business by slow and inadequate freight service and by expedited and adequate service be considered together, they point to the conclusion that the improvement in freight service which has occurred since 1920, and especially since 1922, is worth to the people of the country at least \$1,500,000,000 annually. In other words, it is probably worth to the public seven hundred million dollars more annually than the total net operating income of the railways, and three or four times as much as the entire increase in their net operating income since it declined to its lowest level in 1921.

The improvement in freight service being the most important development affecting the economic welfare of the country that has occurred since the war, it is a question of supreme moment whether the present service can and probably will be maintained. Various conditions which are commonly overlooked have contributed to making it possible. The net increase in the investment in railway property during the last three years has been large, but measured by the power of each dollar invested to pay for materials and labor it has been no larger than in several equal periods before the war. One important reason why it has been so effective has been that freight traffic has not grown as fast as it usually did before the war, and that in consequence the increase in the capacity of the railways has been relatively greater than the increase in traffic. Doubtless the failure of the traffic to grow at the pre-war rate has been partly due to the fact that much of the company's industrial plant was largely expanded before and during the war, that it has been expended relatively less since because its capacity has exceeded the demands on it, and that this has prevented the railways from getting traffic that they would have got in a time of great industrial expansion. Every reduction of business inventories by one ton has not only reduced by one ton the traffic that the railways would have been offered if inventories had not been reduced, but has also reduced by one ton the amount of goods the productive plant of the country otherwise would have been called upon to produce.

The time must come, and may already have arrived, when inventories will not be further reduced. The industrial plant of the country seems reasonably sure largely to expand in future. When that time comes the freight business of the railways will be increased both

by the shipment of materials to enlarge the country's plant and by the shipment of goods to maintain inventories. It may be significant, in this connection, that, although in the spring months of this year many predicted a decline in business activity, the freight traffic of the railways in the first half of the year not only exceeded that in the first half of 1925 by 6 or 7 per cent, but even exceeded that in the first half of 1923, when an abnormally large coal business was being moved as the aftermath of the coal strike of 1922.

In spite of the big traffic they are handling the railways still have a large surplus of equipment. But in the week ended July 23, after loadings had exceeded one million cars weekly for some weeks, the car surplus was 78,000 cars less than in the corresponding week of 1925. There is apparently no reason for believing that traffic will not increase as much from July to October as it did last year, and last October the car surplus was reduced to 100,000 cars. It seems not improbable, therefore, that despite the large increase in their capacity that has occurred within recent years, the railways will soon find it necessary to make great exertions to handle the growing business.

The industry, commerce and finance of the country have adjusted themselves to the new ways of doing business made possible by the improvement in railway service. If traffic should in future so outgrow transportation facilities as to result in congestion and car shortages the results would be calamitous. Business concerns of all kinds that found themselves unable to get orders for shipments filled as promptly as recently would try to increase their inventories by increasing their orders. Traffic would thus become inflated, and the congestions and car shortages would be aggravated. We should then probably have a recurrence on an even larger scale of developments such as occurred in times of transportation shortage in the past—increasing prices, advancing interest rates, a general outcry from farmers and business men against the railways, culminating in a loss of all the benefits now being derived from improved railway service, and business troubles of all kinds.

The only insurance the nation has at present against such developments is the increase that is occurring in the net operating income of the railways. It would have been impossible to render freight service of the amount and quality now being rendered without the investment of capital made in railway properties during the last three years. This capital has been derived partly from earnings, but mainly from the sale of interest bearing securities, and has increased railway indebtedness. It has been invested, not because the net return earned since the war ever has been satisfactory, but in anticipation of the earning of larger returns in future. If these larger returns should not be earned it would not be possible in future to raise the still larger amounts of capital the investment of which the present and prospective growth of freight business indicates will be necessary to enable the railways to handle future traffic as well as they are handling present traffic.

Probably every increase of one dollar annually in the net operating income of the railways until it became ample to enable them constantly to raise all the capital they should invest would be worth at least ten dollars annually to the public because of the effect it would have in enabling the railways to continue to render good and adequate service. For some years before the war the railways were not allowed to earn adequate net returns. The effect was a restriction of railroad development resulting in chronic congestions of traffic and car shortages which cost the public many times as much as

the restrictive regulation saved it in rates. Now, when the net operating income of the railways is largely increasing, the causes of the country's tragic experience with transportation shortages from 1916 to 1920 should not be forgotten, and business men and farmers should demand a policy of regulation which will forever prevent a repetition of that experience.

Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian,
Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

Commercial Travelers' Guide to Latin America. Second rev. ed., by Ernest B. Filsinger. x, 617 p. Pub. by Govt. Print. Off., Washington, D. C. \$1.25. (Bureau of Foreign and Domestic Commerce. Miscellaneous Series No. 89.) [Under each country is a section of its transportation and on routes to and from United States.]

Industrial Directory of the Pennsylvania Railroad System, by Pennsylvania Railroad Co. 572 p. Pub. by Delmont Railroad Advertising Agency, Oak Park, Ill., 1926.

Mineral Resources of the United States in 1925 (Preliminary Summary), by Bureau of Mines. 120 p. Pub. by Govt. Print. Off., Washington, D. C., 1926. 20 cents.

Port and Terminal Facilities, by Roy S. MacElwée. New rev. ed. 446 p. Pub. by McGraw-Hill Co., New York, 1926. \$5.

The Railroad Situation in the Northwestern Region and a Brief Study of the Chicago & North Western Railway, by Hadenpyl Hardy Securities Corporation, New York and Chicago. 6 p. Pub. by the corporations, 1926. Free on request.

Standard Specifications for Structural Steel for Locomotives, by Bureau of Foreign and Domestic Commerce. 16 p. Pub. by Govt. Print. Off., Washington, D. C., 1926. 5 cents.

Transportation, a Survey of Current Methods of Study and Instruction and of Research and Experimentation, by Victor Topping and S. James Dempsey. xviii, 179 p. Pub. by Committee on Transportation, Yale University, New Haven, Conn., 1926.

Periodical Articles

Education's Place in Accident Prevention, by Leonard W. Hatch. American Federationist, August, 1926. p. 935-937.

How As Well As What, by Otto S. Beyer, Jr. Deals with methods of securing improved conditions and union extension. American Federationist, August, 1926. p. 938-946.

Price Fixing for the Farmer, by Henrick Shipstead. Includes discussion of "price-fixing" by railroads. Nation, August 4, 1926. p. 101-102.

Staten Island Prophesied as a World Port, by Harold H. Cassidy. Deals with railroad and harbor facilities at Staten Island. Port and Terminals, August 1926. p. 7-9.

PATRONS of Pennsylvania dining cars will henceforth receive the guarantee that all meat and poultry supplied on the cars has been certified to by the government as being of "blue ribbon" grade. The chief purpose of the step is to co-operate with the Department of Agriculture and the leaders of the meat industry in their efforts to encourage the breeding of high-grade cattle. Arrangements have, therefore, been made with the department, under its newly established inspection plans, to have all meats and poultry examined by government inspectors upon delivery at the company's New York commissary. Only that ascertained to be of the highest quality, "A-1," will be placed upon the cars. Similar arrangements will shortly be made for government inspection at all of the company's other dining-car commissaries.

Letters to the Editor

J. Snowden Bell's Remarks On Locomotive Utilization

NEW YORK.

TO THE EDITOR:

The editorial entitled "Mechanical Men Discuss Engine Use," appearing on page 123 of your issue of July 24, is erroneous, in omitting my name from the list of those who "took the floor." It should have been given immediately succeeding that of O. S. Jackson, of the Union Pacific.

The error has doubtless arisen from a similar one occurring in the report of the discussion at the recent Mechanical Division meeting, appearing on page 1894 of the June 17 issue of the *Daily Railway Age*, my name having been omitted before the two paragraphs immediately preceding the report of the remarks of C. A. Seley, who succeeded me. The two paragraphs referred to apparently state with correctness what I said, but by reason of the omission of my name before them they are attributable to the preceding speaker, Mr. Jackson. He will hardly feel satisfied with the statement of the second of these paragraphs, in which he is thus made to say that the company with which he is connected is a manufacturer of staybolts.

I have caused the secretary to have the proper correction made for publication in the proceedings and consider that a similar correction should be noted in the *Railway Age*.

J. SNOWDEN BELL.

Funding Pension Plans

NEW YORK CITY

TO THE EDITOR:

Reference is made to letter signed "Vice-President," and to the reply by J. C. Clark, in your issue of June 5, 1926, on the subject of "Funding Pension Plans."

Putting aside wholly the question as to the desirability of pension plans for railways, and accepting the situation as it is, may I be permitted to suggest that advance provision for pensions does not necessarily involve either a segregation of securities, or the tying up of cash. The question would appear to be mainly one of accounting. Without regard to its amount or the conditions under which it is granted, every pension of which I have found record becomes payable only after and because of a definite period of service. If this be true, it follows that with each year of service a certain portion of the eventual payment accrues, and that, therefore, under correct accounting methods there should be charged against the operating cost of each year that proportion of the eventual pension which will exist because of the service rendered during that year.

Suppose a railway corporation should purchase electric power under an agreement with the power corporation calling for payment of the power consumed each year the tenth year thereafter. Certainly neither the I. C. C. nor any other accountant would permit a calculation of profit or of operating costs for the current year that did not take into account the present value of the future payment that will be made for the power consumed. On the other hand, proper accounting would

not permit a charge against the operating cost ten years hence for power consumed this year.

It will be objected that in dealing with the pension situation many contingencies may arise which make difficult the advance calculation of present costs. This is true because there is no advance knowledge of future salary scales and future labor turnover, but even when such uncertainties must be taken into account an approximation can be made, and as suggested by Mr. Clark in an earlier paper, a slight revision of the formula by which benefits are calculated would easily remove a large part of the present uncertainty. Even as it is, actuarial estimates not falling very wide of the mark are perfectly possible, and are in fact in use in dealing with actual pension schemes.

To carry the analogy previously used a little further, it is wholly conceivable that the price to be paid ten years hence for the electric power consumed this year might be indeterminate within certain limits, in which case the maximum of the predetermined limits would be a justifiable primary charge, subject to credits at the time of final adjustment.

Just as it is possible closely to approximate the amount which should be set up each year to provide for the future payments of the pensions accruing that year, so it is possible to approximate the sum which should have been set up each year in the past, and by allowing appropriate credits, to arrive at the total which, had the proper charges been made to operating cost during the year the service was rendered, would now stand on the books.

If the theory of accounting here set up be accepted, it follows that operating costs for many years past have been under-stated, and that profits have been larger or deficits have been smaller than a just accounting would show. In some cases there now exists a book surplus more than sufficient to balance this debit. In other cases its setting up today would merely involve an increased deficit; for it is clearly impossible to recover from former stockholders any dividends which they have received in excess of what they would have received under this system of accounting.

As a matter of expediency, and in view of the manifest injustice of burdening the stockholders of any single year with the accrued liability for many years that have passed, the charge covering this item might best be set up on the books in a series of instalments covering the next thirty or forty years.

Two concrete facts would seem in this whole discussion to stand out clearly.

1. That the executive officers of every railway should know

- (a) As nearly as possible the amount that would stand on the books today had the future pension of all present employees been charged to operating costs during the period of service already rendered, as above suggested.
- (b) As nearly as possible the present value of the future pensions that would arise out of the service of those active each year.

2. It is my understanding that the Interstate Commerce Commission has provided an account (No. 457), to which is chargeable every payment made for current pensions, thus recognizing pensions as a proper operating charge. It is difficult to believe that the commission would question the setting up of this liability as it accrues regardless of the time of payment.

Whether, in order to meet its pension payments as they fall due, the management of a railway chooses to deposit cash or securities in a separate fund has, as I

see it, no bearing whatever on the main point at issue, and is entirely of a piece with the choice of method adopted to meet any other acknowledged obligation which is payable in the future.

INGALLS KIMBALL,
Director of Group Annuities, Metropolitan Life Insurance Company

The Positive Meet

HAILEYVILLE, Okla.

TO THE EDITOR:

I have read with considerable interest the article by Mr. Droege which appeared in the *Railway Age* of June 19. The time-table positive meet may prove all right on some eastern roads where trains are run practically on time but it will not be a success on roads where the service is irregular by reason of connections, switching enroute, short side tracks, difficult grades and wire trouble. The only foot note essential on any time table is that which specifies the direction of trains having superiority.

There must be some kind of superiority even with the positive meet; if not there will be a question as to what train is entitled to the main track at the meeting point.

We must use superiority by direction in handling extra trains, of which there are a number these days. By the use of the time-table positive meet the practice of putting signals on schedule trains, to overcome some unfortunate circumstance which has happened, would be out of the question.

In this part of the country where the farm houses are few and far between and many of them not provided with the telephone it would be a hard matter for a conductor to effect communication with the dispatcher in the middle of the night were his train held up by the positive meet. The telegraph offices on some roads are far apart and to allow a half dozen trains to enter a blind territory of 50 or 60 miles on time-table positive meets would in many cases entail serious delays. In fact, in some cases, such a procedure would tie up the railroad from stem to stern. Such a plan in this part of the country will not save any train orders but will only make *more*, because with the time-table positive meet it will be necessary to put out orders which are unnecessary under superiority by direction.

J. L. Coss.

Physical Examinations--- When and Why

NEW YORK, N. Y.

TO THE EDITOR:

One form of economy in railway operation can never be effected by management alone. That is the reduction of absenteeism due to illness.

Despite all that management can do with respect to health conditions in shops and on the trains, sanitation, lighting, ventilating, heating and periodic physical examinations for employees, the major responsibility still rests with the employees. Management can't be a "mind-reader" and detect when a man has a headache, dizziness, a pain or any other of nature's confidential distress signals.

If sickness and consequent absenteeism is to be reduced to any measurable degree on the railroads, the employees themselves must be educated to the point where they will recognize and take definite action in

response to the first danger warnings which they receive concerning their physical well being.

It may not be amiss therefore to describe in brief a few of the warnings that nature displays when all is not going well and which demand recognition and an inspection trip to the doctor if breakdown is to be avoided.

Headaches that recur more or less regularly; one of the most insistent warnings associated with a variety of causes, frequently referring to the eyes or the digestion.

Shortness of breath—often coming on gradually; this is usually a sign that too great a load is being put upon the heart and blood vessels, and that they are beginning to give way, or that the lungs are diseased.

A cough that persists usually indicates trouble with the lungs or air passages, occasionally with the heart.

Swelling of the ankles or puffiness under the eyes indicates failing of the circulation due usually to the heart or the kidneys.

A tendency to "catch cold" easily or to "sore throats" should never be allowed to continue unchecked.

Pain that persists or recurs in any spot,—joints, limbs, abdomen or chest is always a notification of damage to some organ or structure.

Dizziness coming on at any time, after eating, after sudden exertion may be due to a variety of causes, some of them of a serious nature.

Disturbances of vision may indicate a need for glasses or a change in the type of glasses worn, and may also indicate disease.

Loss of weight—particularly if progressive even though very gradual, is one of the most constant symptoms of grave diseases, including tuberculosis and cancer.

Sores anywhere on the skin, or in the body openings, that do not heal or show a tendency to recur may indicate the beginning of a malignant tumor—cancer.

A trip to the drug store or the concoction of a home remedy will alleviate many of these symptoms, even though severe or distressing. But if this is our only response to the cry for help we have defeated nature's purpose. We may remove or destroy the warning but we have not given nature the aid she is entreating and the underlying defect or disease is still there, perhaps accumulating sufficient power to overwhelm us.

The reason that millions of dollars' worth of patent medicines are sold every year is that they offer some degree of temporary relief from the symptoms for which they are taken. If it were possible to induce the buyers to ascertain the real cause of their discomfort by physical examinations, the span of life would be further increased.

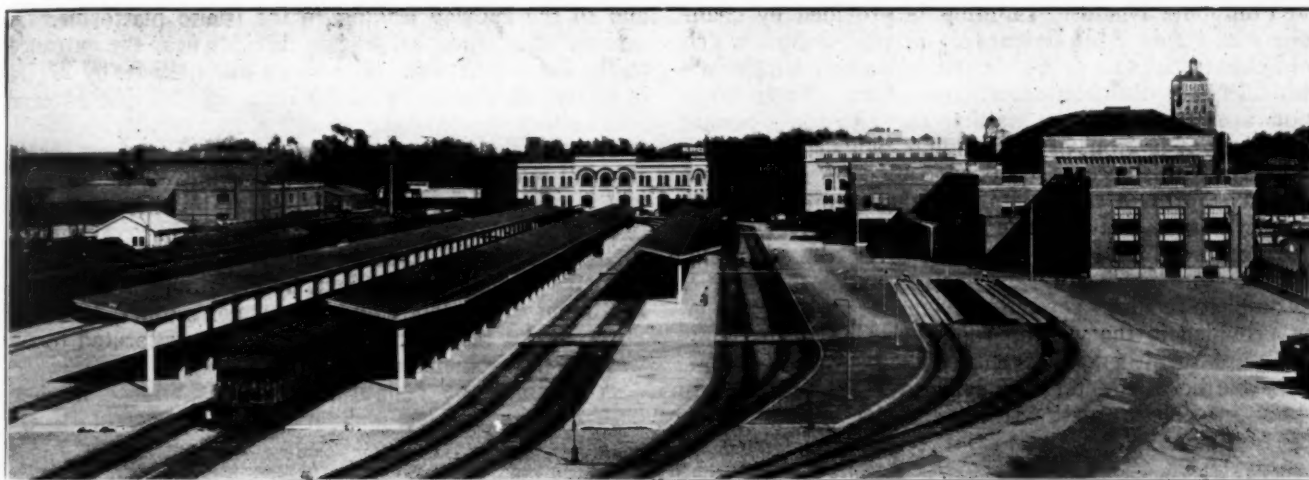
We can check a cough by cough dope, we can ease a headache by pills or powders, we can relieve a pain by liniments or poultices but in so doing we accomplish nothing towards aiding our system to overcome the abnormal conditions which have caused these symptoms. It is right and proper to relieve symptoms, especially if severe, but the intelligent person will also endeavor to find out what is causing these symptoms, and there is only one way to find out, and that is by securing a physical examination by a physician. Once we know what is wrong we can utilize to advantage the resources of scientific medicine for cure or at least improvement.

We often hear of sudden deaths due especially to various forms of disease of the heart, blood vessels and kidneys. In reality such deaths are never sudden. Nature has been sending out warning signals continuously, and there is no reason why such diseases should exist and their presence not be suspected. There is no real excuse for anybody being informed for the first time that he has an inoperable cancer whose presence was unsuspected, or that he is well along in tuberculosis, Bright's disease or diabetes. Nature never stabs us in the dark.

The persistence of troublesome symptoms indicates that a physical examination has become a necessity and should not be put off.

A. J. LANZA, M.D.,

Policyholders' Service Bureau, Metropolitan Life Insurance Company.



The Island Platforms Are Covered with Butterfly Sheds—Southern Pacific Photo Service

Southern Pacific Builds Station at Sacramento, Cal.

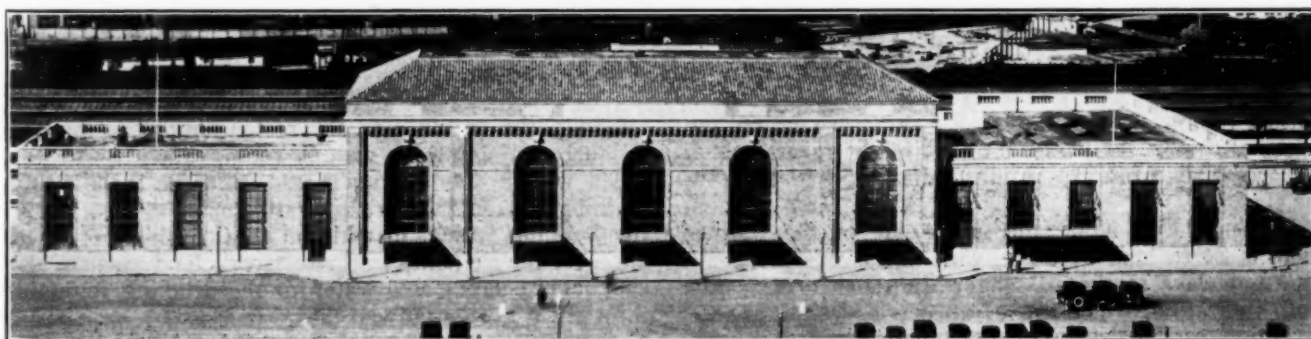
Structure is of artistic design and furnishes facilities which combine convenience and comfort

THE Southern Pacific's new passenger station at Sacramento, Cal., which was completed a few weeks ago, is one of the most modern stations on the Pacific coast and one of the finest structures in Sacramento. The total cost of the project, including the main and auxiliary buildings, together with the necessary adjuncts and track work, entailed an expenditure of \$2,317,000.

The passenger station proper is of the Italian type of architecture. It is 370 ft. long, with a width of 54 ft. at the west end and 128 ft. at the east end. The central portion of the building, which houses the waiting room and concourse, is 83 ft. wide. The structure is built of

architectural terra cotta and the lines of the structure, enhanced by eight circular topped windows, 35 ft. high and glazed with amber colored cathedral glass, combine with the color treatment of the walls and roof to furnish a harmonious and pleasing aspect. The building fronts on two city blocks between Third and Fifth streets, north of I street, and pains have been taken to make the approaches to the station in keeping with its appearance. A driveway 100 ft. wide extends along the south face of the building and between this driveway and I street two small parks were laid out artistically with flowers and shrubbery.

The waiting room occupies a space 56 ft. wide by 114



Southern Pacific Photo Service

The Station is of Artistic Design

reinforced concrete, with a steel frame, on pile foundations and is three stories in height, the second and third floors being used as offices for the Sacramento division and for the lines north of San Francisco.

The exterior walls are faced with brick with a mingled light russet color, while a darker russet tiling is used on the sloping roof. The entire building is trimmed with

ft. long in the central portion of the building and its treatment is such as to provide convenience as well as comfort. The vaulted ceiling is decorated with five-color stencil work, harmonizing with the cathedral glass and Venetian drapes of the large windows. The floor is of California marble, trimmed with travertine, while the wood trim is of Lamao mahogany, imported from

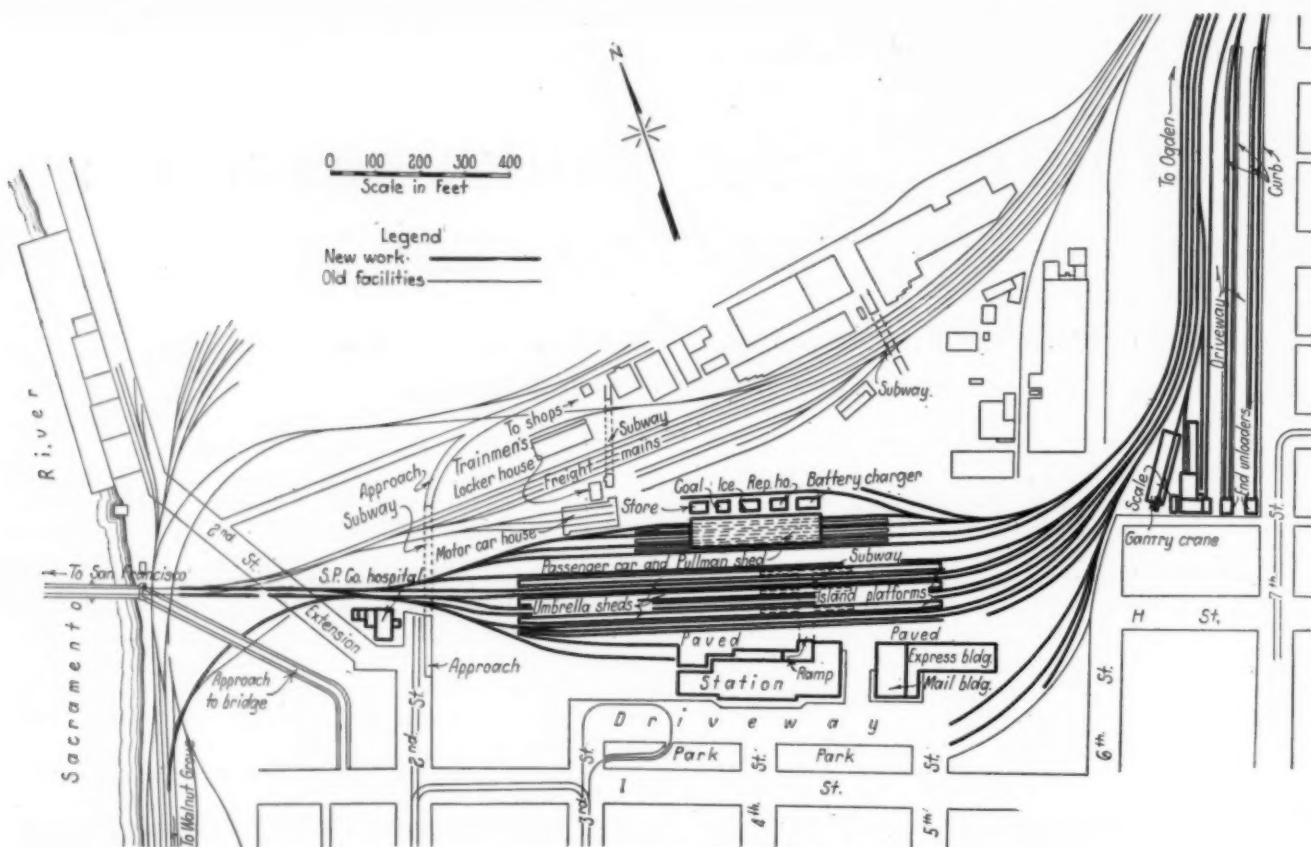
the Philippine Islands. Lighting is provided by chandeliers and side light fixtures of artistic design which hold clusters of soft-toned electric bulbs and which furnish adequate illumination without glare. Three large doorways open from the waiting room to the sidewalk and driveway in front of the building, while three similar doorways furnish access to the concourse. Each of these doorways forms a continuation of the openings for the large windows and those leading to the driveway are provided with canopies extending over the sidewalk. The radiators for heating are located under the settees.

Complete facilities for the convenience of the traveler are provided in the waiting room or in adjacent rooms which are furnished in keeping with the waiting room. A marble ticket counter with spaces for six ticket sellers and an information desk is located in the east end of the

and to the subway leading to the island platforms. A taxicab office is located on this corridor near the entrance to the baggage room. The men's toilet, 19 ft. by 27 ft., is located east of the smoking room and may be entered from either the smoking room or the corridor.

West of the waiting room is a lobby extending across the full width of the waiting room and 30 ft. wide, in which are located a commercial telegraph office, a battery of telephone booths, and a traveler's aid bureau where a matron is always available during train hours. The women's retiring room, 27 ft. by 27 ft., opens off of the north end of the lobby and the women's toilet, 10 ft. by 20 ft., and a rest room 9 ft. by 12 ft., are located to the west of the women's retiring room.

A commodious restaurant, together with a kitchen, occupies the greater portion of the west end of the



Layout of Station and Track Facilities

waiting room. Back of the ticket counter are located the offices of the district passenger and freight agents, which are accessible from the waiting room as well as from the street.

The concourse along the north side of the waiting room is 84 ft. long by 26 ft. wide and is provided with four gateways to the passenger train platforms. The train indicators, which are of attractive design, are the invention of Patrick Flanagan, chief engineer of the Company's hospital at San Francisco and were described in the *Railway Age* of May 15. The news stand and parcel room are located at the west end of the concourse while at the east end are located the offices of the station master and the dispatcher, the latter office being constructed so as to be sound proof.

The men's smoking room, 25 ft. by 27 ft., is located in the northeast corner of the central portion of the building, opening off a corridor leading from the waiting room, which also gives access to the baggage room

building, the entrance to the restaurant being through the lobby adjoining the waiting room, which is also provided with a door giving access from the front of the building. A complete refrigerating plant is installed in the building which, in addition to furnishing refrigeration for the ice boxes in the restaurant and kitchen, also supplies circulating cold water for the drinking fountains throughout the station and the offices.

A ventilating system installed in the attic exhausts the fumes and foul air from the kitchen, restaurant and lavatories.

The greater part of the east wing of the building is occupied by the baggage room which is 65 ft. by 128 ft. in size, giving ample room for the convenient handling of baggage. Passengers may enter the baggage room either from the waiting room or from the street. Four concrete platforms along the east side of the building with sliding doors for the reception of baggage from trucks while three rolling steel doors, 10 ft. wide, open

from the north side of the baggage room to the passenger train platforms.

A mail and express building, harmonizing in exterior design and finish with the passenger station, is located



Southern Pacific Photo Service

The Waiting Room is Spacious and Well Lighted

80 ft. east of the baggage room. This building, which is L-shaped, is 280 ft. in length with a width of 60 ft. at the east end and 128 ft. at the west end. It contains a spiral mail chute and an electrically-driven conveyor for

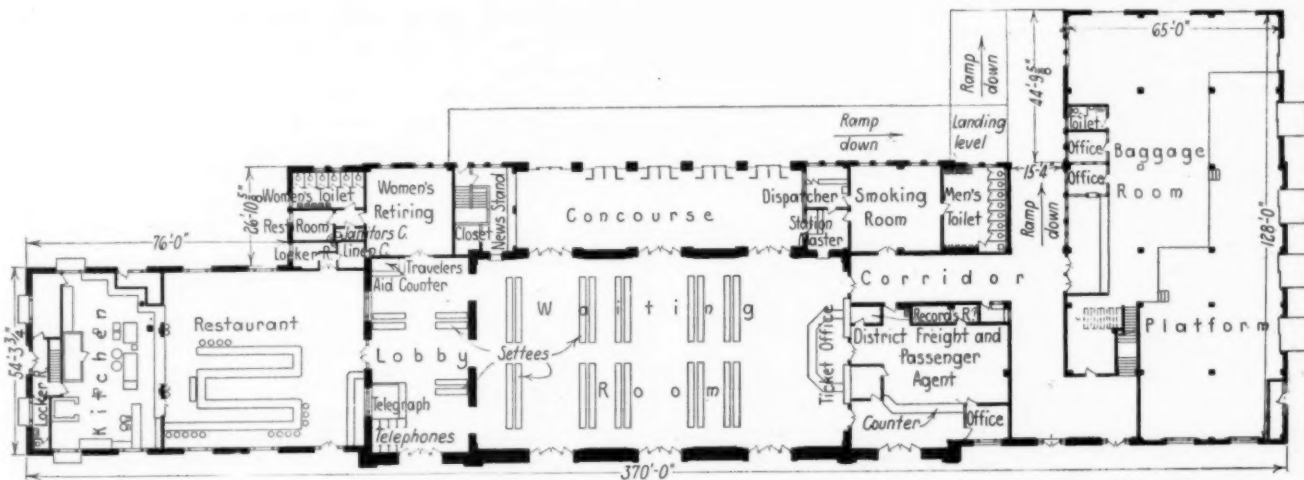
station to the island platforms, entrance to and egress from the subway being provided by ramps.

In addition to the passenger train tracks, four tracks were built north of the passenger tracks to serve as a coach yard for the storing and cleaning of passenger cars. A car shed 60 ft. by 280 ft., has been built over a portion of these tracks to serve as a shelter for Pullman cars which lay over at this point, protecting them from the direct rays of the sun and keeping them cool and comfortable for occupancy at night.

East of the passenger station facilities five team tracks, with a total capacity of 100 cars, have been built to replace other tracks which were taken up to permit the construction of the new station. Concrete driveways connecting with the paved streets of the city were installed between the tracks and a modern automobile unloading dock has been built adjacent to one of the tracks, together with a conditioning house fully equipped for the prompt handling of automobile shipments.

The station building was designed by Bliss & Fairweather, architects, of San Francisco, in co-operation with the architectural bureau of the Southern Pacific and the general contract for the structure was awarded to Davidson & Nicholson of Stockton, Cal. The contract for the mail and express building was awarded to W. E. Keating of Sacramento, the plans for this building, as well as those of the island platforms, track work, etc., having been prepared in the office of W. H. Kirkbride, engineer maintenance of way and structures, under whose general supervision the entire project was carried to completion. Immediate supervision in the field was under the direction of W. F. Turner, division engineer, with headquarters at Sacramento, and J. H. Christie, architect, whose headquarters are at San Francisco.

LOUISVILLE, KY., described as the "Crossroads of the Nation" is the subject of a booklet which has been published by the Ken-



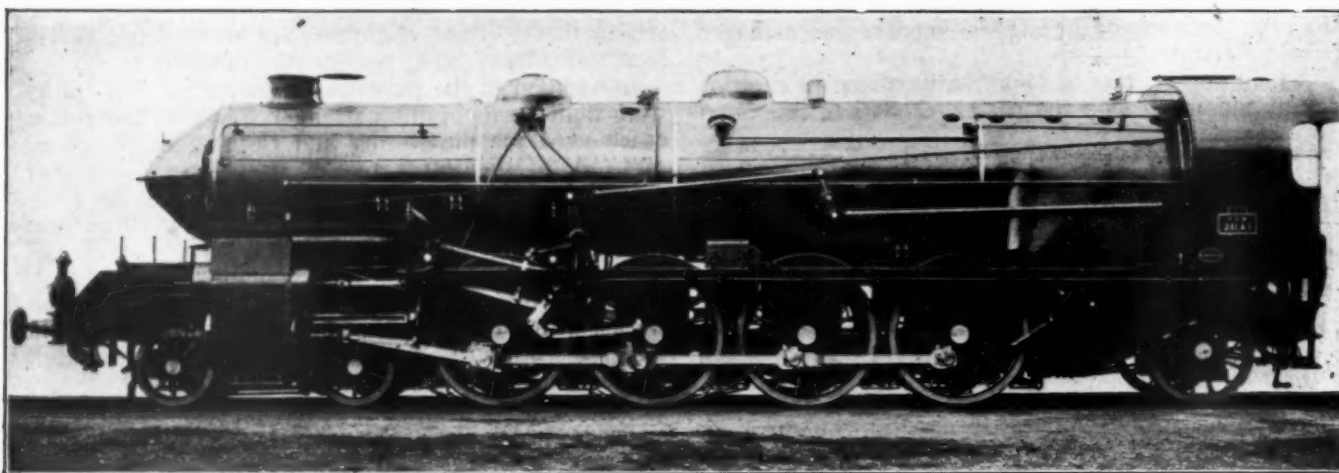
Floor Plan of Station

handling mail to various parts of the building, as well as other conveniences for facilitating the work.

The passenger train tracks, seven in number, extend along the north side of the building. Six of these tracks are located in pairs with a concrete island platform between each pair, while the seventh track is located alongside a paved platform adjacent to the concourse. The island platforms are 1,000 ft. long, of commodious width and are covered with butterfly sheds built of structural steel. A well-lighted concrete subway leads from the

tucky & Indiana Terminal, Louisville. It describes the city's industries, population, transportation, mineral resources, etc.

ONE OF THE TEN COLONIAL DINING CARS now in service on the Baltimore & Ohio has been named the "Betty Zane," to honor the name of the heroine of Fort Henry of 1782, the site of which is marked by Wheeling, W. Va. The sister cars of the "Betty Zane," now in operation on the Baltimore & Ohio, are the "Martha Washington," "Dolly Madison," "Betsy Ross," "Betsy Patterson," "Molly Pitcher," "Nellie Custis," "Molly Stark," "Priscilla Alden," and "Abigail Adams."



The Paris, Lyons, Mediterranean Four-Cylinder Compound Mountain Type Locomotive

French Four-Cylinder Compound 4-8-2 Type Locomotive

Develops 41,446 lb. tractive force, with 40,000 lb. axle loads—Grate area large for European practice

By M. Chambon

Principal Engineer of Rolling Stock, Paris, Lyons and Mediterranean Railway

THE Paris Lyon, Mediterranean Railway placed in service in February, 1925, a test four-cylinder Mountain type locomotive which weighs, in running order, 259,380 lb., of which 159,940 lb. are on the drivers. This locomotive, which has 70½-in. driving wheels, and develops a tractive force of 41,446 lb. and a drawbar horsepower of 2,750, was used to haul high-speed passenger trains of heavy tonnage on the main line of the system between the stations of Laroche and Dijon, which part of the line shows an exceptionally hard profile. The main line track for a distance of 82 miles is almost a steady up grade, becoming especially steep between the Laumes and Blaisy stations, where it reaches on certain stretches an .8 per cent grade. On the grade, starting from Dijon, the trains have to go for a distance of about 13 miles, over a grade of between .7 and .8 per cent.

The passenger trains on this line are normally handled by locomotives of the 4-6-2 type, with driving wheels 78¾ in. in diameter, having a weight on drivers of 122,355 lb. and developing 2,070 hp. at the drawbar.

In view of the tonnage of the fast trains increasing constantly, and of the special conditions under which the running schedules of these trains, which operate in groups, and in view, furthermore, of the fact that the heavy grades follow each other very closely, a new type of passenger locomotive, more powerful and having greater adhesion had to be considered. During the 1926 summer service, 17 fast passenger trains leave Paris in the evening. These trains pass through the Laumes station with 9 min. to 18 min. between train departures. During the reverse movement, the trains are operated in two groups, one made up of nine trains running rather close together, since the average interval separating the

two movements, is 12 minutes. It is, therefore, indispensable that, in view of some possible unforeseen stop on the grade, the acceleration of these trains must be very rapid in order to avoid serious operating trouble.

However, in this respect, the Mikado type 2-8-2 locomotives, which are fitted with the same boilers as the Pacifics but which have a weight on the drivers of 154,322 lb. and a driving wheel diameter of 65 in., have shown a very clear superiority over the Pacifics. This superiority seems to be attributed to the weight on drivers rather more than to the larger cylinders.

The following table shows the essential characteristics of these two types of locomotives:

Type	4-6-2	2-8-2
Diameter of driving wheels	78¾ in.	65 in.
Working pressure	225 lb.	225 lb.
Grate area	45.7 sq. ft.	45.7
Firebox area	169 sq. ft.	169
Heating surface tubes	2,203 sq. ft.	2,203
Superheating area	760 sq. ft.	760
Number of cylinders	4	4
Diameter of cylinders (H. P.)	17⅞ in.	20 5/64 in.
(L. F.)	25½ in.	28 11/32 in.
Piston stroke (H. P.)	25½ in.	25½ in.
(L. F.)	25½ in.	27⅞ in.
Weight in running order	205,402 lb.	208,625 lb.
Weight on drivers	122,355 lb.	154,322 lb.

Moreover, it had been noted that the 2-8-2 type locomotives could maintain with ease a speed of 55.9 m.p.h. which fact permitted the possibility of using four pair of drives on the passenger locomotives.

These various considerations finally led the P.L.M. to build a locomotive more powerful than the Pacific which, by means of an additional pair of driving wheels, would possess much greater adhesion.

The Boiler and Accessories

The boiler has an enlarged firebox, which extends beyond the frames. The shell of the firebox is made of one

piece, cylindrical in its upper part, and is directly cross-stayed with the crown of the inner shell by means of hollow staybolts. It contains a combustion chamber.

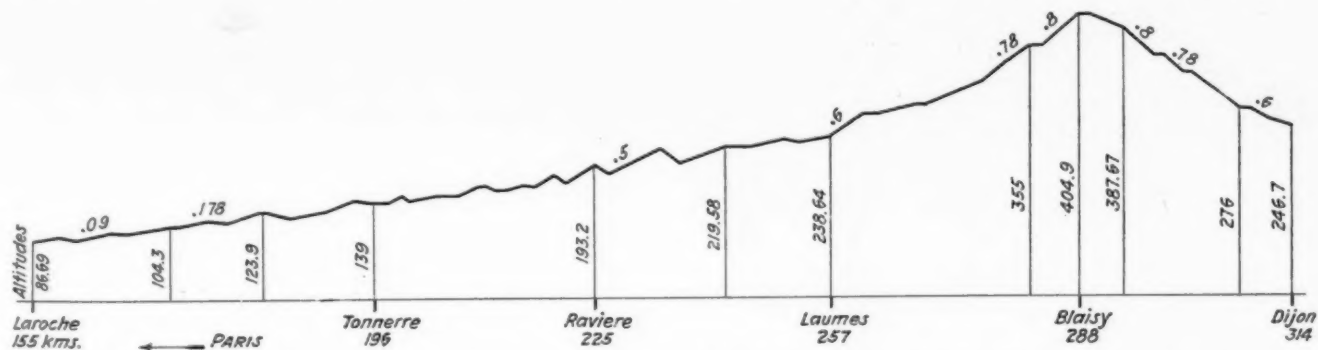
The firebox as well as the combustion chamber is made of copper; the tube sheets only are made of steel. The sides, as well as the front and rear sheets of the firebox are connected with the outside sheets by means of manganese bronze staybolts, which are drilled their entire length and closed on the outside. The grate area, which is exceptionally large for a European locomotive, is 53.8 sq. ft.

In order to avoid too great a weight, the distance be-

from the shock of the wheels against the rails, were this axle to be the first of the coupled axles.

The steam distribution in the cylinders is controlled by the Walschaert valve gear. The valves of the inside cylinder are driven by a simplified arrangement which utilizes the motion of the outer valve by means of a shaft and rod gear. In view of the distance which separates the high and low pressure cylinders, it has been found necessary to have two counter shafts.

The regulating of the steam distribution is such that when the cut-off of the high-pressure cylinders is 50 per cent, it corresponds to 63 per cent cut-off for the low



Profile of the P. L. M. Line Between Laroche and Dijon—The Altitudes Are Shown in Meters, the Distances in Kilometers and the Grades in Percentages

tween the flue sheets has been reduced to 19.7 ft. which resulted in lengthening the smoke box to 9 ft. 9 in.

Running Gear and Mechanism

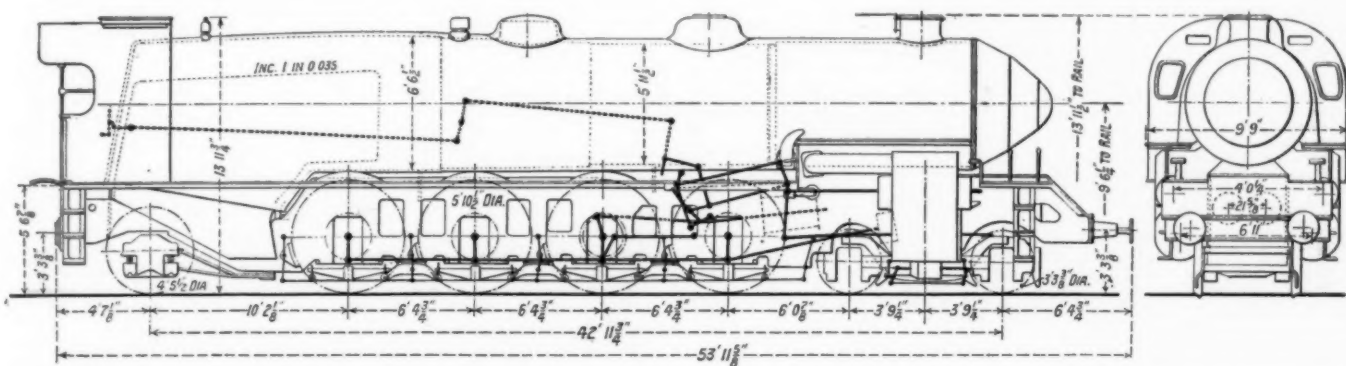
The running gear is suspended by means of leaf springs, secured at their centers below the driving boxes and to the frames at their ends by means of spring hangers fitted with adjustable nuts. All of the springs on one side of the locomotive are connected together by means of equalizing beams located between the driving wheels. The spring arrangements for the engine and trailing trucks are independent of the main spring arrangement and are independently suspended from the driving wheel suspensions.

Owing to the large diameter of the low pressure

pressure cylinders. The maximum cut-off of the high-pressure cylinders is 75.2 per cent and that of the low-pressure cylinders is 85.3 per cent. There is no fixed difference between the relative high and low pressure cut-offs, as will be shown in the following table:

Cut-off in per cent		
H. P.	L. P.	Difference
20	28	8
30	42	12
40	54	14
50	63	13
60	73	13
75.2	85.2	10.1

This simplified distribution, which requires only one rocker shaft, is generally used on all modern compound locomotives of the P.L.M. It affords great advantages



Side Elevation and End View of the Paris, Lyons, Mediterranean Four-Cylinder Compound Mountain Type Locomotive

cylinders they have been located outside of the frames. These cylinders operate the first pair of driving wheels. The high pressure cylinders are located inside the frames a little ahead of the low pressure cylinders. They are inclined and drive the second pair of driving wheels. This arrangement is interesting because the axle driven by the inner cranks is a crank axle. Thus, it is possible to avoid all excessive wear and tear which might arise

in view of the weight decrease, as well as in maintenance costs.

A five feed condensing lubricator is used to send oil into the high and low pressure cylinders and the air compressor. The locomotive is equipped with automatic and independent air brakes and a cross-compound air compressor. It is also provided with a turbo-generator. The tender is carried by two four-wheeled trucks. It

has a water capacity of 7,926 gal. and of 7 tons of coal. Its total weight in full running order is 142,638 lb.

Results Obtained in Service

On June 1, 1926, the Mountain type locomotive had run 32,934 miles. The results obtained while making this mileage were all that had been expected. Particu-

TABLE I—DYNAMOMETER DATA SECURED DURING THE TEST RUNS OF THE P. L. M. FOUR-CYLINDER COMPOUND MOUNTAIN TYPE LOCOMOTIVE

	Laroche to Laumes 62.7 mi. 45 m.p.h.	Laumes to Blaisy 19.2 mi. 35.4 m.p.h.	Laroche to Blaisy 72 mi. 42.9 m.p.h.
Distance			
Average speed			
Horsepower developed at draw bar	1,271 hp.	1,559 hp.	1,362 hp.
Consumption of water and coal			
	Water, gal.	Coal, lb.	
Total Gross.....	8,850.7	12,015	
Total net (for pulling the train)	8,788.3	9,594	
Per 1,000 gross ton-miles.....	106.3	114.	
Per draw bar hp. (net consumptions)	3.18	3.47	
Average rate of combustion			
		Lb. of coal per sq. ft. of grate per hr.	
Laroche to Laumes.....		81.9	
Laumes to Blaisy		100.5	

larly gratifying was the rapid acceleration on the grades. With a train weighing 630 tons, it was possible after a stop on an .8 per cent grade to attain a speed of 36 m.p.h. in a distance of 1.8 miles. This locomotive pulled a 585-ton train from Laroche to Dijon, which is a distance

TABLE II—DIMENSIONS, WEIGHT AND PROPORTIONS OF THE P. L. M. FOUR CYLINDER COMPOUND MOUNTAIN TYPE LOCOMOTIVE

Railroad	Paris, Lyons, Mediterranean
Type of locomotive.....	Mountain, four-cylinder, compound
Service	Passenger
Cylinders, dia. and stroke.....	H. P.—20 in. by 25½ in. L. P.—28¼ in. by 27½ in.
Valve, piston type, size.....	H. P.—9¾ in. L. P.—14½ in.
Maximum valve travels.....	H. P.—6¼ in. L. P.—8¾ in.
Lap at admission.....	1¼ in.
Lend at exhaust—negative lap.....	¾ in.
Maximum cut-offs, per cent.....	H. P.—72 L. P.—85
Weight in working order:	
On drivers	163,140 lb.
On engine truck.....	56,394 lb.
On trailing truck.....	38,076 lb.
Total engine	257,610 lb.
Wheel bases:	
Driving	19 ft. 2¾ in.
Rigid	9 ft. 2¾ in.
Total engine	42 ft. 11¼ in.
Wheels, diameter outside tire:	
Driving, main	76½ in.
Front truck	9¾ in.
Trailing truck	33½ in.
Boiler:	
Type	Cenical
Steam pressure.....	25 lb.
Fuel, kind	Bituminous
Diameter, first ring.....	71½ in.
Firebox, length and width.....	57¼ in. by 78¾ in.
Tubes, number and diameter.....	45—2½ in.
Flues, number and diameter.....	40—5½ in.
Length over tube sheets.....	9 ft. 7¼ in.
Grate area	1.8 sq. ft.
Heating surfaces:	
Firebox and comb. chamber.....	53 sq. ft.
Tubes and flues.....	496 sq. ft.
Total evaporative	751 sq. ft.
Superheating	225 sq. ft.
Comb. evaporative and superheating.....	976 sq. ft.
General data estimated:	
Rated tractive force.....	13,600 lb.
Drawbar horsepower	750
Weight proportions:	
Weight on drivers ÷ total weight engine, per cent.....	63.9
Weight on drivers ÷ tractive force.....	1.95
Total weight engine ÷ comb. heat surface	64.5
Boiler proportions:	
Tractive force ÷ comb. heat surface.....	10.46
Tractive force x dia. drivers ÷ comb. heat surface	1.35
Firebox heat surface ÷ grate area.....	1.74
Firebox heat surface, per cent of evap. heat surface.....	9.27
Superheat surface, per cent of evap. heat surface	44.5
Comb. heat surface ÷ grate area.....	73.8

of 100 miles. It was possible, without any trouble, to shorten the running time by 20 minutes as normally performed with locomotives of the Pacific type. On these trains the average consumption 1,000 ton-miles is 98.5 gal. of water and 97 lb. of coal.

49.7 M. P. H. Up-Grade

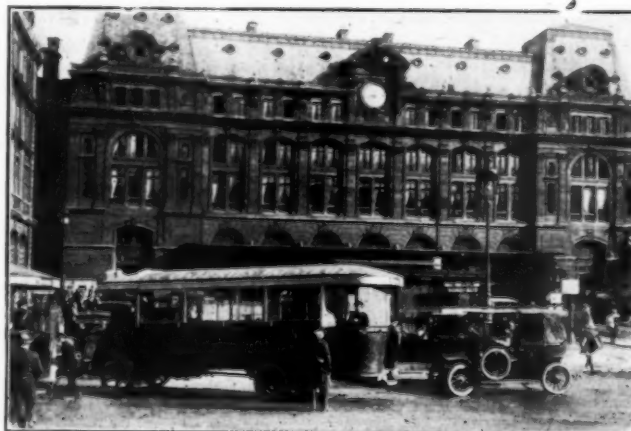
Two trains, one weighing 705 tons on the Laroche-Dijon run; the other weighing 641 tons on the Dijon-Laroche run. The first mentioned train was hauled, under excellent conditions, at a speed of 49.7 m.p.h. which was maintained with ease on the steep Laumes to Blaisy grade, which averages .7 per cent. During the run of the second train mentioned, a speed of 62 m.p.h. was maintained on long stretches between Laumes and Laroche, which is on a descending grade. In this direction and, in case of being late, it often happens that a speed of 68 m.p.h. is attained which speed is said to be the maximum for this locomotive.

On December 5, 1925, a special train, which was run between Laroche and Dijon, was made up of 22 cars, one of which was a dynamometer car. The tonnage of the train was 854 tons. Table I shows some interesting data collected during these test runs.

The temperature of the superheated steam averaged between 360 to 380 deg. F.

44 More to be Built

In view of the results arrived at with the test locomotive, the P.L.M. has decided to have built 44 locomotives of the same type. These locomotives will not differ from the test locomotive except in some detail modifications, the principal one dealing with the superheater. Some tests undertaken recently by the P.L.M. have led to the conclusion that one of the important elements to consider, in order to secure a high superheating temperature is the relation existing between the resistances offered to the flow of gases by the nest of large tubes containing the superheater elements on the one hand and by the nest of the small flues on the other. Taking into consideration the results obtained by the tests, it has been decided to change the arrangement of the flues and tubes in the new locomotives so as to provide 143 2½-in. tubes and 33 5 5/16-in. flues. Notwithstanding the resultant decrease in superheating area, it will be possible to secure the same steam temperature values as obtained in the test locomotives. Furthermore, this alteration will reduce the weight of the locomotive about 4,400 lb. which will permit the installation of a feedwater heater without any increase in the present weight.



St. Nazaire Station, Paris

Pullman Rates Not Shown Unreasonable

I. C. C. examiner recommends no reduction pending completion of valuation

WASHINGTON, D. C.

THE Interstate Commerce Commission on August 9 made public a proposed report by Attorney-Examiner John B. Keeler, recommending a finding by the commission that the charges of the Pullman Company for sleeping and parlor car accommodations are not shown to be unreasonable and that no reduction should be made pending the outcome of the valuation which is now being made of the company's property.

While the report says that the accuracy of the company's estimates, showing a return on property investment of 5.67 per cent in 1925, cannot be determined upon the record, it says that "they lend such support to defendant's contentions, however, that the commission should hesitate to order a reduction in defendant's charges predicated solely on the earnings on the book investment which is the only indication of unreasonableness afforded by the record."

If the depreciation reserve be deducted from the book investment, Mr. Keeler says, the rate of return for 1925 would be 9.55 per cent and if income tax accruals be eliminated from operating expenses the rate would be 11.08 per cent. However, he refers to an increase of approximately \$1,000,000, in operating expenses resulting from an increase in wages and improved working conditions for porters and maids effective on February 15, 1926, and also says that a reduction in the Pullman charges under the present contracts would seriously affect that part of the revenues which are shared with the rail carriers. Referring to the commission's recent admonition to the western roads to survey the passenger situation with a view to putting this branch of their operation upon a better paying basis, Mr. Keeler says that the contracts between the roads and the Pullman Company are worthy of careful scrutiny by the rail carriers as a part of such survey. Mr. Keeler is the same examiner who two years ago recommended that the commission order the abolition of the 50 per cent surcharge and that the railroads recoup themselves by getting more compensation from the Pullman Company.

The report arises from the complaint filed by the Order of United Commercial Travelers of America, supported by other organizations of commercial travelers, assailing the increase in Pullman rates of 20 per cent made on May 1, 1920, the only general increase made by the company since its organization in 1867, which had followed a reduction made by order of the commission in 1911. It is very brief, as commission documents go, comprising only seven mimeographed pages, and deals almost entirely with the earnings of the company rather than with the rates themselves. The full text of the report follows:

The complaint in No. 11567, filed by an incorporated association of commercial travelers and supported by other similar organizations which intervened, assails as excessive the rates of the Pullman Company, hereinafter referred to as defendant, for accommodations in sleeping and parlor cars. On May 1, 1920, defendant increased its rates for such accommodations approximately 20 per cent and complainant contends that such increase was unjust and unreasonable and prays that the charges be reduced to the level in effect prior to the increase, and that

defendant be ordered to "return to passengers such excessive tariffs as have been collected." Hearings upon this complaint were held and a proposed report was issued by the examiner recommending that the complaint be dismissed. It developed during those hearings that much of the dissatisfaction with the existing charges for accommodations in parlor and sleeping cars was attributable to the so-called surcharge of 50 per cent of the Pullman charges proper, which surcharge, although collected by defendant, accrues solely to the railroads. It also appeared that a general examination of the accounts and accounting practices of defendant was desirable and on April 2, 1923, the commission entered a general order of investigation into the propriety and reasonableness of the surcharge and of the rates of defendant for accommodations furnished passengers in sleeping and parlor cars throughout the continental United States. No. 11567 was consolidated with, and the accounting examination was undertaken as a part of, the general investigation. The bases of compensation as between the railroad companies and defendant with respect to the use of sleeping and parlor cars was also made a part of the investigation.

It developed that the examination of defendant's accounts would require considerable time to complete and rather than delay disposition of the question of the lawfulness of the surcharge until that examination had been completed the commission separated the issues and proceeded to a determination of the surcharge feature. In *Charges for Passengers in Sleeping and Parlor Cars*, 95 I. C. C. 469, the surcharge was found not to be unreasonable.

The increase assailed is the only general increase which has been made by defendant since its organization in 1867. There was a reduction of 20 per cent in upper berth charges in 1911 so that the general level of charges for such space is no higher today than it was a half century ago.

Very little evidence was introduced by complainants in No. 11567 in support of their allegation that the rates of defendant were excessive. Rather they relied to a large extent upon Section 15(7) of the interstate commerce act which provides that as to any rate, fare or charge increased after January 1, 1910, the burden of proof to show that such increased rate, fare or charge is just and reasonable shall be upon the carrier.

At the time of the original hearings in No. 11567, defendant as one corporate entity was engaged in the operation of sleeping and parlor cars as a common carrier, in the construction of cars for sale to other carriers and in other manufacturing activities. Although separate accounts were kept for the operating and manufacturing departments, there was such commingling of the affairs of the two that satisfactory data with regard to the common carrier part of its activities, which is the only part subject to the commission's jurisdiction, was difficult to obtain. The situation was changed during the course of the investigation, however, through the divorce voluntarily by defendant of the two departments and the creation of a separate corporation to control the manufacturing activities.

As the result of the examination of the accounts of defendant certain of its accounting practices have been changed and the following revised investment and operating income figures for the years ended December 31, 1923, December 31, 1924, and December 31, 1925, have been secured:

	1923	1924	1925
Investment:			
Plant and equipment....	\$164,144,542.25	\$178,761,995.20	\$206,825,709.13
Working capital	5,210,877.47	4,429,460.55	4,386,959.94
Materials and supplies.	3,000,000.00	3,000,000.00	3,000,000.00
Cash*			
Total	\$172,355,419.72	\$186,191,455.75	\$214,212,669.07
Net operating income....	9,070,457.74	6,796,012.85	12,146,220.02

* Estimated.

If the above book investment figures are used as representing the value for rate making purposes of defendant's property used for transportation, its rate of return was 5.26 per cent in 1923, 3.65 per cent in 1924 and 5.67 per cent in 1925. An element to be taken into consideration in this connection, however, is that during the period in question defendant had an accrued depre-

ciation reserve of \$74,563,071.03 in 1923, \$78,889,339.64 in 1924 and \$87,131,154.38 in 1925, which had been accumulated through charges to operating expenses. If the depreciation reserve be deducted from the book investment as set forth above to arrive at a rate base, the rates of return for the years in question would be increased to 9.27 per cent in 1923, 6.33 per cent in 1924 and 9.55 per cent in 1925. See *Lum v. G. N. Ry. Co.*, 33 I. C. C. 541, and *New York-Jersey City Ferry Rates*, 37 I. C. C. 103. Furthermore, there were charged to operating expenses during this period Federal income tax accruals of \$2,390,274.48 in 1923, \$1,190,423.89 in 1924 and \$1,933,642.02 in 1925. In *Reduced Rates*, 1922, 68 I. C. C. 676, the commission said:

In our view railway corporations should, like other corporations, pay their federal income taxes out of income, rather than collect it, in effect, from the public in the form of transportation charges adjusted to enable it to retain the designated fair return over and above the tax.

If the income tax accruals be eliminated from operating expenses, defendant's operating income would be \$11,460,732.21 in 1923, \$7,986,436.74 in 1924 and \$14,079,862.04 in 1925, and, using as a rate base the book investment after deductions for accrued depreciation, the rates of return would be 11.72 per cent, 7.44 per cent and 11.08 per cent, respectively.

Defendant states that owing to heavy demands by the railroads for cars during 1923, 1924 and 1925, it was unable to maintain its normal program of shop repairs and contends that this resulted in under-maintenance of its cars of \$1,306,890.58 in 1923, \$2,459,290.80 in 1924 and \$5,252,715.52 in 1925. In estimating this claimed under-maintenance, defendant, after making adjustments to cover differences in relative price levels in the two periods, compares the maintenance accounts for 1923, 1924 and 1925 with the same accounts for the three-year period ended June 30, 1917. The ratio of steel to wooden cars increased materially during the three years from 1923 to 1925 over the three years ended June 30, 1917. For example, in 1915 defendant had 2,199 wooden cars and 5,008 steel cars, whereas in 1925 it had 430 wooden cars and 8,293 steel cars. The estimates offered by defendant do not take into account this difference in character of equipment in use during the two periods. Maintenance expenditures during a period when wooden cars predominated are not to be taken as a fair criterion of maintenance expenditures necessary during a period when steel cars predominated. Furthermore, the maintenance accounts include not only actual expenditures for repairs but also charges for depreciation, and in adjusting the maintenance expenditures for the three years ended June 30, 1917, to take into account the increased price levels existing in 1923, 1924 and 1925, the increased price factors were applied to the depreciation accruals as well as to the actual expenditures for repairs. The comparisons offered in support of the claimed under-maintenance are clearly defective and cannot be accepted as establishing defendant's contention.

Defendant contends that the value of its property for rate making purposes is greatly in excess of its recorded property investment, and in support of that contention placed in evidence a valuation study of its property as of December 31, 1921. This study shows an estimated reproduction cost new of \$277,031,929 and a reproduction cost new less depreciation of \$172,807,185. These estimates are contrasted with a recorded property investment as of the same date of \$157,878,314, or \$89,611,407 after deduction of accrued depreciation. The commission has not concluded its valuation of the property of defendant and the accuracy of defendant's estimates cannot be determined upon this record. They lend such support to defendant's contentions, however, that the commission should hesitate to order a reduction in defendant's charges predicated solely on the earnings on the book investment which is the only indication of unreasonableness afforded by the record.

Another matter to be given weight in the consideration of whether defendant's charges should be reduced is that under the contracts between most of the more important railroads and defendant the respective railroad participates in the revenues in excess of certain specified amounts per car earned by cars operated on its line. Although it is impossible to determine on the present record the precise effect which any given reduction in defendant's charges would have on the revenues of the rail carriers, it is evident that such a reduction would most seriously affect that part of the revenues which are shared with the rail carriers. The failure of the rail carriers in the Western district to earn a fair return from their passenger operations is discussed in *Revenues in Western District*, 113 I. C. C. 3. Statistics of record in the instant case indicate that the condition there commented upon as existing in the western territory also prevails in other sections of the country.

As hereinbefore stated, the contractual relations between the rail carriers and defendant were made a part of the investigation. A study of the contracts discloses great lack of uniformity in their provisions, due in considerable degree, it is stated by defendant, to varying conditions on different railroads. The contracts represent the results of bargaining between defendant

and the respective railroads and in such dealings the lines having the most traffic to offer naturally get the better contracts. Also there is considerable lack of uniformity in the contracts with the more important railroads—greater lack perhaps than justified by the circumstances. The commission has no authority to prescribe the terms of the contracts between defendant and the rail carriers, but in *Revenues in Western District*, *supra*, it admonished the western railroads to survey the passenger situation with a view to putting this branch of their operations upon a better paying basis. The contracts with defendant are worthy of careful scrutiny by the rail carriers as a part of such survey.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended July 31 amounted to 1,102,590 cars, the highest figure recorded for any week this year and an increase of 56,964 cars as compared with the corresponding week of last year. As compared with 1924 there was an increase of 156,977 cars. Increases as compared with the corresponding weeks of the last two years were reported from all districts and in all classes of commodities except livestock, which showed a reduction of 751 cars as compared with last year. Grain and grain products loading 63,905 cars, showed an increase of 12,878 cars and coal loading an increase of 10,392 cars, while miscellaneous loading showed an increase of 14,534 cars. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

REVENUE FREIGHT CAR LOADING—WEEK ENDED JULY 31, 1926

Districts	1926	1925	1924
Eastern	259,067	249,336	221,913
Allegheny	223,425	209,942	190,836
Pocahontas	61,840	54,596	42,412
Southern	148,796	145,791	131,487
Northwestern	167,780	157,969	139,057
Central Western	162,205	149,589	151,625
Southwestern	79,477	78,403	68,283
Total Western	409,462	385,961	358,965
Total all roads	1,102,590	1,045,626	945,613
Commodities			
Grain and grain products	63,905	51,027	56,670
Livestock	27,061	27,812	26,472
Coal	192,609	182,217	145,636
Coke	11,441	9,404	6,900
Forest products	72,004	71,533	66,934
Ore	75,393	63,637	55,038
Mdse., l. c. l.	261,233	255,586	239,885
Miscellaneous	398,944	384,410	348,078
July 24	1,085,450	1,033,519	926,309
July 17	1,083,626	1,012,854	930,713
July 10	900,977	986,893	909,983
July 3	1,072,624	866,199	757,904
Cumulative total 31 weeks	30,281,731	29,273,581	27,655,674

The freight car surplus for the period July 23-31 was 199,073 cars, including 104,796 box cars, 56,785 coal cars and 11,688 refrigerator cars. The Canadian roads for the same period had a surplus of 25,920 cars, including 23,400 box cars.

Car Loading in Canada

Revenue car loadings at stations in Canada for the week ended July 31 showed an increase of 2,116 cars over the previous week. Compared with the same week last year the total increase was 10,595 cars.

Commodities	Total for Canada			Cumulative Totals To Date	
	July 31 1926	July 24 1926	Aug. 1 1925	1926	1925
Grain and Grain Products	3,796	4,111	3,787	200,360	172,556
Live Stock	2,305	2,032	2,357	59,671	65,396
Coal	6,716	6,355	2,251	150,446	95,340
Coke	237	201	245	11,301	8,232
Lumber	4,268	4,183	3,895	108,701	105,205
Pulpwood	2,656	2,347	2,159	89,590	87,179
Pulp and Paper	2,036	2,140	1,954	74,538	61,744
Other Forest Products	2,618	2,669	2,580	97,748	88,335
Ore	2,230	2,018	1,645	48,364	39,889
Merchandise, L. C. L.	16,809	16,953	15,782	478,840	452,071
Miscellaneous	17,756	16,342	14,217	406,187	353,262
Total Cars Loaded	61,467	59,351	50,872	1,725,746	1,529,209
Total Cars Rec'd from Connections	37,435	38,009	34,326	1,113,292	992,869



Official Trains Leaving Fifty-third Street—Underwood Photo

Illinois Central Officially Opens Its Electrified Suburban Service

Civic organizations of Chicago stage celebration in honor of road and its officers

WITH electric trains bearing 2,000 members of commercial and civic organizations of Chicago running side by side on four parallel tracks from Hyde Park (53rd street) to Roosevelt Road (12th street), Chicago, the Illinois Central officially opened its electrified suburban service on August 7, seven months ahead of the scheduled date of completion specified in



The Trains Bore Wreaths from Various Stations Along the Route

the city ordinance, although trains have been in regular service since July 21, as described in the *Railway Age* of July 24, page 129. This was the major feature in the day's celebration of the latest development in Chicago's transportation facilities which definitely linked the city and its southern suburbs with its largest suburban transportation agency. From the time when four special steam-operated trains left the Randolph street suburban station of the Illinois Central at 11 o'clock on Saturday morning, carrying guests for the inbound official electrification specials, until the members of more than 100 civic organizations and their guests left the

banquet room of the Palmer hotel that evening, the day was crowded with a program depicting the prominent place of transportation in the life of that community.

Headed by the Governor of Illinois, the Mayor of Chicago and officers of the Illinois Central, members of the civic and commercial organizations of the city and suburbs and other invited guests left the southern terminus of the electrification zone at Matteson, Ill., 28 miles from Randolph street, at noon on Saturday on two special trains, gaily decorated with festoons and streamers in honor of the occasion. At Kensington they were joined by a third train bearing a delegation from the communities along the Blue Island branch and at 67th street by a similar train from the South Chicago branch. From 53rd street these four trains, bearing more than 2,000 persons, ran side by side on adjacent parallel suburban tracks to 12th street. The trains were escorted by airplanes and by yachts on Lake Michigan and were greeted by a continuous roar of bombs, fireworks and whistles from adjacent industries, locomotives, etc. Stops were made at the various stations where wreaths and other expressions of felicitation were presented. These trains were manned by veteran engineers (motormen) and conductors, whose average length of service was 37 years.

On arrival at 12th street the party proceeded to the Grant Park stadium in Soldiers Field where a procession of several hundred floats was reviewed and "Miss Transportation" crowned by A. E. Clift, senior vice-president of the Illinois Central. Following this a pageant depicting the progress of transportation was presented to nearly 40,000 spectators. This pageant, which was staged on behalf of the people of Chicago by the Women's division of the Electrification Celebration committee, was divided into 10 episodes illustrating (1) the trail of the wilderness with Indians traveling by canoe and dog trains; (2) trappers and early settlers breaking through the underbrush on horseback; (3) Indians, trappers and settlers following the wagon trail; (4) the beginning of organized transportation with the stage coach

and pony express; (5) navigation on the sea; (6) miscellaneous means of transportation; (7) oriental transportation with elephants, jinricksha, etc.; (8) the days of the horse-drawn vehicle; (9) the coming of the motor car, and (10) electrification. More than 3,000 school children and members of playground groups and singing societies participated in this pageant.

As a feature of the occasion an exhibit of passenger train equipment operated by the Illinois Central at various periods of its history was presented on tracks adjacent to Soldiers Field. This included the diminutive wood-burning locomotive "Mississippi," which was operated between Natchez and Foster, Miss., as early as 1834; locomotive No. 1401, which has been in continuous suburban service for 46 years, and mountain type locomotive No. 2421, which was purchased in 1925, and which weighs five times as much as Locomotive 1401 and forty times as much as the Mississippi. A similar exhibit of passenger coaches included Coach No. 1062, a gas-lighted car of wooden construction which has been in continuous use since 1881, and modern all-steel electric-lighted passenger coaches built for operation in the electrified service.

The day's celebration closed with a banquet attended by more than 1,000 persons tendered to the officers of the railroad by the members of the 116 civic organizations. Here the officers were toasted for their accomplishments by Len Small, governor of Illinois; George M. Reynolds, president of the Continental and Commercial National Bank; J. A. Schiller, assistant corporation counsel of Chicago, presenting Mayor Dever of Chicago, and William Hale Thompson, former mayor of Chicago. In the absence of C. H. Markham, president of the Illinois Central, A. E. Clift, first vice-president, responded for the road.

Mr. Clift Describes Growth

of Illinois Central Service

In his address, Mr. Clift referred to the growth of the Illinois Central's transportation service in Chicago in part as follows:

"The electrification of our suburban service is not the end of our Chicago terminal improvement; it is a beginning. Before this program is completed—if railway construction can ever be called complete—we shall have electrified also our freight service and, under certain conditions, our through passenger service and we shall have constructed a new passenger station that for size, convenience and accessibility will be a model of its kind. Coincident with the electrification of the suburban service we have carried to completion several other important projects, including the revision of grades, rearrangement of tracks, elimination of grade crossings and the construction of a great freight classification yard—any one of them a project of major importance in the railway world.

"Some idea of the scope of this work may be obtained from a consideration of the following figures: The complete undertaking involves the movement of approximately ten million cubic yards of earth, the addition of 250 miles of track to the terminal facilities, the electrification of 420 miles of tracks, the depression or elevation of 80 miles of tracks and the realignment of 120 miles of tracks. In the electrification of the suburban service proper, it has been necessary to erect more than 900 catenary structures and to string approximately 293 miles of transmission wires and 470 miles of messenger and contact wires. We have had built to our order 130 motor cars and 130 trailers, providing a seating capacity for nearly 22,000 patrons at one time. The construction has had to be carried on without interfering

with the normal operation of an extremely busy terminal. Approximately 600 trains a day use the Illinois Central terminal tracks at Chicago, in addition to which 125 switch engines are at work at various times.

"A great city, because it is not self-supporting, must rely for its very life upon transportation, and mostly upon railway transportation. Further to co-ordinate itself into a unit, with a residence district here and a business district there, a city must have both urban and suburban transportation that can be relied upon. The future of Chicago, as of every other great city of the world, depends in large measure, if not altogether, upon the character of the transportation it receives. To give you some idea of what Illinois Central suburban transportation has helped to do for Chicago's south side, when the right-of-way of our railroad was purchased through what is now Hyde Park, then the town of Lake, in the early fifties, we paid for our 60 acres at the rate of \$30 an acre. This land, in the 75 years ensuing, has become worth much nearer \$30 a square foot.

"From 8 trains daily, our suburban service has grown to more than 400; yet it is to be doubted if this increase tells the whole story of the increases in population and in property values that have accompanied it. The suburban zone now extends from downtown Chicago to Matteson, 28 miles away, to South Chicago, 13 miles away, and to Blue Island, 20 miles away. From approximately 75,000 passengers the first year, the patronage of the suburban service has climbed to in excess of 26,000,000 annually, having considerably more than doubled in the last 25 years. Today out of every 37 trips taken on the Class I railroads of the United States 1 trip is taken on the Illinois Central suburban service at Chicago.

"In electrifying our suburban service we expect to save some money in the long run in the cost of operation and to increase the patronage of the service. Electric operation of this and other services should also make it possible for us to realize upon our air rights near the loop. In these and other ways we expect to realize some return on our investment. Yet it is to be doubted if the eventual return expected would have been enough to launch us upon this program if there had not been added to it the incentive to hold and to increase the good will of the people of Chicago. Good will cannot readily be measured in dollars and cents, but the presence or lack of it means the difference between prosperity and adversity in many kinds of business, including railroading. Good will has been defined as 'the disposition of the pleased customer to return to the place where he has been well treated.' Good service is what makes pleased railway customers, and we have therefore made it our constant endeavor to improve our service, in both plant and morale."

FOLLOWING ACTION TAKEN by the Minneapolis & St. Louis reducing rates on grain and grain products from Minneapolis via Peoria gateway to territory east of Buffalo and Pittsburgh by six cents a hundred lb., the Minneapolis, St. Paul & Sault Ste Marie has reduced rates on grain and grain products from Minneapolis via Sault Ste Marie into New England territory by a similar amount. According to F. R. Newman, vice-president in charge of traffic of the Soo Line, the Soo will put the reduced rate into effect anywhere east of Buffalo and will make the rate effective through its other gateways if eastern lines agree to join with it in the new rate. At a meeting of representatives of the eastern trunk lines in the official classification territory at Chicago on August 3, however, it was decided that the eastern roads will protest the proposed six-cent reductions before the Interstate Commerce Commission. These lines will ask the commission to suspend the proposed rates on or before August 25, when they are to become effective.

Ford Railroad Plan Disapproved

Interstate Commerce Commission examiner recommends dismissal of application for reorganization

WASHINGTON, D. C.

HENRY FORD has been given another reminder that as an operator of railroads subject to the interstate commerce law he is governed by many restrictions that do not apply to a manufacturer. On several occasions since his purchase of most of the stock of the Detroit, Toledo & Ironton in 1920 the Interstate Commerce Commission has had reason for calling the attention of its management to the laws and regulations which apply to railroads generally, and in several ways they have been found to delay or interfere with plans that the management had proposed.

This time the reminder takes the form of a proposed report by Examiner Ralph R. Molster recommending a dismissal of the applications for authority for the proposed acquisition by the Detroit & Ironton, a company organized by the Ford interests, of control of the Detroit, Toledo & Ironton and the Toledo-Detroit by purchase of stock and other securities and by purchase of the properties, franchises and assets. He also recommends a denial of the application for authority for the issue of \$23,294,300 of capital stock. The Ford interests own a majority of the stock of the D. T. & I., and it owns most of the stock of the Toledo-Detroit, but there is a minority interest which objects to the Ford plans.

The recommended dismissals and denial are not based on the protests of the minority, however, although they are discussed in the report, but on the ground that the plan "involves consolidation of those carriers into a single system for ownership and operation within the meaning of paragraph 2 of section 5 of the interstate commerce act," as amended by the transportation act in 1920, and that such consolidation is not permitted by the act until after the commission has adopted the complete consolidation plan contemplated by paragraph 5 of section 5. The examiner also says that such acquisition does not fall within the purview of paragraph 18 of section 1 of the act, under which one application was filed, and cannot be accomplished thereunder.

Even if jurisdiction could be entertained under paragraph 18 of section 1, according to the recommended findings, the present and future public convenience and necessity are not shown to require the acquisition, and application for authority for consolidation under paragraph 6 of section 5 is "premature." Presumably for these reasons, the examiner recommends a finding that the proposed security issue and assumption of liabilities are not necessary, or appropriate, or compatible with the public interest.

In view of the conclusions reached in the report, the examiner says, it is unnecessary that all collateral issues raised by contentions of the applicants and the interveners be individually discussed, but the report includes several comments, without the expression of conclusions, regarding the methods by which the Ford interests have handled the finances of the companies and regarding some of the details of the reorganization plan, and the examiner says: "That there is discrimination against the minority appears from the fact that they are given no choice but to accept the cash equivalent of the value placed on their stock by agencies of the majority. Although the directors may have intended to be fair, and in good conscience may deem the provision for the

minority eminently fair and proper, the evidence is far from convincing that their conclusions were reached in a manner consistent with fair dealing. Whether the assigned value of approximately \$104.27 per share, common and preferred, is fair to the minority the commission ought not to be called upon to decide."

In conclusion the report says:

Paragraph (18) of section 1, paragraph (2) of section 5, and paragraph (6) of section 5 of the interstate commerce act were simultaneously enacted in the transportation act, 1920, and by that statute inserted in the interstate commerce act. See transportation act, 1920, sections 402 and 407. The provisions of paragraph (18) of section 1, pertaining to the extension, construction, and acquisition of railroad properties, are aimed at overexpansion, a fruitful source of disaster in any enterprise for pecuniary profit, and, in the business of transportation particularly, a source of undue burden upon rate payers. Paragraph (6) of section 5 is designed to enable the consolidation of railroad properties for common control, management, and operation in conformity with a comprehensive plan to be adopted and published by the commission. While the commission has agreed upon the tentative plan of consolidation provided for in paragraph (5) of section 5, the complete plan has not been adopted. Pending adoption of the plan, paragraph (2) of section 5 enables the union of railroad properties in a manner falling short of consolidation, subject to prior authorization from the commission. Assuming authorization from the commission to be prerequisite, it is apparent that a proposed union of railroad properties that can not be accomplished under paragraph (2) of section 5, because involving consolidation within the meaning thereof, nor under paragraph (6) of section 5, because the time is not yet ripe, may not be accomplished under the provisions of paragraph (18) of section 1 of the act.

Upon the facts presented, it is recommended that the commission find:

1. That the proposed acquisition by the Detroit & Ironton Railroad Company of control of the Detroit, Toledo and Ironton Railroad Company and the Toledo-Detroit Railroad Company, by purchase of stock and other securities and by purchase of all railroad properties, franchises, and assets (except the franchise to be a corporation, and certain cash), involves consolidation of those carriers into a single system for ownership and operation within the meaning of paragraph (2) of section 5 of the interstate commerce act.

2. That the proposed acquisition by the Detroit & Ironton Railroad Company of all the railroad properties, franchises, and assets (except the franchise to be a corporation, and certain cash) of the Detroit, Toledo & Ironton Railroad Company, including the properties of the Toledo-Detroit Railroad Company, involving consolidation of those carriers into a single system for ownership and operation within the meaning of paragraph (2) of section 5 of the interstate commerce act, does not fall within the purview of paragraph (18) of section 1 of the act, and can not be accomplished thereunder.

3. That, even if jurisdiction could be entertained under paragraph (18) of section 1 of the interstate commerce act, the present and future public convenience and necessity are not shown to require acquisition and operation by the Detroit & Ironton Railroad Company of the lines of railroad of the Detroit, Toledo & Ironton Railroad Company, including the line of the Toledo-Detroit Railroad Company.

4. That application by the Detroit & Ironton Railroad Company and the Detroit, Toledo & Ironton Railroad Company for authority under paragraph (6) of section 5 of the interstate commerce act to consolidate their properties, including properties of the Toledo-Detroit Railroad Company, into one corporation for ownership, management, and operation, is premature; and

5. That the proposed issue of \$23,294,300 of capital stock and the proposed assumption of obligation and liability in respect of securities of the Detroit, Toledo & Ironton Railroad Company and the Toledo-Detroit Railroad Company, by the Detroit & Ironton Railroad Company, are not necessary or appropriate, or compatible with the public interest.

The applications recorded in Finance Docket No. 4807 and in

Finance Docket No. 5149 should be dismissed. The application recorded in Finance Docket No. 5150 should be denied.

The Detroit & Ironton, referred to in the report as the D. & I., and the Detroit, Toledo & Ironton called the Ironton, on April 30, 1925, filed a joint application (a) under paragraph (18) of section 1 of the act, for a certificate that the present and future public convenience and necessity require the acquisition and operation by the D. & I. of the lines of railroad of the Ironton, including the line of the Toledo-Detroit Railroad Company, a subsidiary of the Ironton, hereinafter referred to as the Toledo, or, in the event that that part of the application be denied, (b) for authority under paragraph (6) of section 5 of the act, to consolidate the properties of the D. & I. and of the Ironton, including the properties of the Toledo, for ownership, management and operation. The application is recorded in Finance Docket No. 4807. On October 26, 1925, the D. & I. filed an application, recorded in Finance Docket No. 5149, for authority under paragraph (2) of section 5 of the act to acquire control of the Ironton by purchase of stock and by purchase of all the properties, franchises and assets of the Ironton, excepting only certain cash. By a third application, recorded in Finance Docket No. 5150, the D. & I. asked authority under section 20a of the act (a) to issue \$12,308,800 of common stock, (b) to issue \$10,985,500 of series C, 5 per cent first-mortgage gold bonds, and (c) to assume obligation and liability in respect of certain outstanding securities of the Ironton. At the hearing the applicants filed amendments to the applications asking for authority (a) to issue \$23,294,300 of common stock, instead of \$12,308,800 of such stock and \$10,985,500 of bonds, and (b) to assume obligation and liability as originally proposed.

The Detroit & Ironton is a new company of which Henry Ford, Mrs. Clara V. Ford and Edsel B. Ford own all the stock, and which at one time proposed to lease the D. T. & I., but the plan was dropped. It has an authorized capital stock of \$25,000,000 and holds the title to lines constructed since the Fords acquired the D. T. & I., but they are operated by the old company. The directors of the two companies are elected by the Ford interests and are the same, as are the officers.

The report says it is clear from the testimony that separate operation of the two properties has never been intended, but that "so far as single operation of the properties is concerned, there is little showing in the record of the desirability, from a public viewpoint, of operation of all the properties of the D. & I., rather than by the Ironton, as at present." While "much is said in the record as to an inclination to finance a major part of the contemplated improvement program through the use of capital stock of the D. & I.," the report says, "the record is not clear as to reasons preventing necessary financing being done with additional capital stock of the Ironton * * * nor is there evidence as to reasons preventing relocation of the line south from Springfield being accomplished by the D. & I., and the new line furnished for use by the Ironton under arrangements similar to those in effect for use of the Fordson-Flat Rock line or originally contemplated for use of the Durban-Malinta cut-off." Also, the examiner says, "it is inconceivable, for obvious reasons, that if the present efforts by the D. & I., to acquire the properties of the Ironton be thwarted, traffic now obtained by the Ironton would be withdrawn for ulterior purposes."

After referring to the large increase in the earnings of the D. T. & I., since it passed into the control of the Ford interests, which originate more than 50 per cent of its tonnage, the report says that the stockholders apparently thus far have received no direct benefit, through

the payment of dividends, from the improvement in the earnings of their company. No funds have been set aside for dividends on the preferred stock and interest has not been paid on the adjustment 5 per cent bonds, of which the Ford interests own \$7,571,441 out of a total of \$7,630,981. On March 31, 1925, cumulative accrued interest unpaid on those bonds amounted to \$2,384,475.72.

It is stated that the plan for the purpose of the properties of the Ironton by the D. & I., was "evolved" without consultation with or knowledge of Henry Ford, and that an appraisal was made by the D. T. & I. valuation engineer, estimating the cost of reproduction, less depreciation, at \$30,227,475. On this basis a value of \$104.27 per share was computed, without consideration of "possible elements of value not stated in the books of the companies, such as earning power and good will," and this was the figure offered to the minority stockholders, who on March 31, 1925, held 1.9 per cent of the common stock and 0.96 per cent of the preferred stock, although the Ford interests are said to have acquired at least 18 shares of stock since.

The Ford interests have entered into a contract with the D. & I., agreeing to transfer to it their holdings of stock and bonds of the D. T. & I., in exchange for \$23,294,300 of the common stock of the D. & I. The title to the adjustment 5s has already been delivered to the D. & I., and on January 30, 1925, notice had been given that the Ironton had elected to redeem all the outstanding adjustment 5s on April 1, 1925, at 100 with cumulative interest accrued, although the examiner says that "neither at the time the call was made nor at the time the bonds became payable, by virtue of the call, was the Ironton in possession of cash or liquid assets in an aggregate amount anywhere approximating the \$10,015,456.94 principal and interest, which the company elected to pay on the designated date of redemption. Only \$76,650 was deposited with the trustee under the mortgage to pay adjustment 5s, with accrued interest, which might be presented by holders of those bonds in pursuance of the call. The only provision made for satisfaction of the \$7,571,441.53 of adjustment 5s, and interest accrued thereon in the sum of \$2,366,058.47, total \$9,937,500, delivered by the Ford interests to the D. & I., was for ultimate surrender of the bonds to the Ironton in part consideration for the transfer of its properties. The indebtedness of the D. & I. to the Ford interests on account of this transfer of adjustments 5s is carried in open account. In suits by the Ford interests to recover from the D. & I., or by the D. & I. to foreclose the adjustment mortgage upon the properties of the Ironton, the court might have something to say concerning personal liability on the part of directors approving and authorizing a transaction so conceived and so executed."

Minority Protest

The directors of the D. & I., on April 13, 1925, authorized the execution of a contract with the Ironton providing for the sale to the D. & I., of all its properties, franchises and assets, except the franchise to be a corporation, and a sum of money representing the "fair value" of the outstanding stock (held by the minority) not delivered to the D. & I., and for the surrender by the D. & I., to the Ironton of certain securities to be obtained from the Ford Interests. The D. & I., was to assume the obligations and liabilities of the D. T. & I., except those represented by the securities surrendered to it by the D. & I. This contract was approved by the directors and stockholders of both companies, but the representatives of the minority interests in the D. T.

& I. protested and cast 1,121 votes against the resolution.

After all the transfers, according to the report, the D. & I. would still own approximately 58 per cent of the outstanding stock of the D. T. & I., which would be left with \$451,051.60 cash, \$432,600 of capital stock outstanding, and \$18,451.60 corporate surplus, but "would have no property left with which to continue its service as a carrier" and "it is not contemplated that the Ironton shall ever again operate as a railroad." Corporate existence, under control of the D. & I., would be maintained for the purpose of distributing the remaining assets and it is intended to wind up the affairs of the company when its obligations have been taken care of "if the minority stockholders do not object."

Consolidation Frankly Conceded

"It is frankly conceded in the record," the examiner says, "that the transactions involve virtual consolidation of the properties of the Ironton and the Toledo with the properties of the D. & I., for common ownership and operation."

All of the holders of outstanding stocks and bonds of the Ironton were not afforded opportunity to participate in the contract between the Ford interests and the D. & I., and the interveners contended that the provision made for minority stockholders is unfair because they are not accorded the same treatment under the plan as the majority, and because, in the evaluation of the stock of the Ironton for the purposes of the plan, no consideration was given to the elements of earnings and good will.

While the examiner says that there is discrimination against the minority, he says the commission should not be called upon to decide whether the assigned value is fair to the minority and that "such matters are properly for settlement among the interested parties." The interveners contended that the minority stockholders of the D. T. & I. have an absolute right to share in the proposed transactions upon the same terms as the majority, that is by receiving securities of the D. & I., in exchange for their shares. They also took the position that paragraph 2 of section 5 cannot be applied to a consolidation. The applicants replied that the commission has authority to authorize a consolidation in accordance with the plan presented and that the interveners have no interest in the application, or if they have any interest it is merely to see that they are not being unlawfully or unfairly deprived of rights.

* * *



Wide World

The Boston Wolverine Leaving South Station

Wants More Information Before Approving Project

WASHINGTON, D. C.

THE Interstate Commerce Commission has denied, without prejudice to a resubmission, an application filed by a commission acting with the authority of the legislature of North Carolina for a certificate authorizing the construction of a railroad by one of the three alternative routes from a point in the western part of North Carolina into the state of Tennessee, to serve the so-called "lost provinces" of North Carolina. Funds for the construction were to be advanced by the state of North Carolina from the sale of \$10,000,000 of state bonds, to be made available to a corporation to be known as the Appalachian & Western North Carolina Railway, after the proposed road has been located and the location and construction authorized by the Interstate Commerce Commission. The report by Division 4 of the Interstate Commerce Commission expresses some doubt as to the reliance placed by this provision of the state law upon its finding but believes that "the spirit of the act under which we are proceeding, as well as the necessity of the most definite and complete evidence that can be secured, require the selection of a single route for our consideration, rather than a number of alternative routes."

"If the state of North Carolina desires to construct the proposed line of railroad," the report says, "to further the interests of the people living in a section of the state which is now much less favored with means of transportation than other sections and is willing to assume the financial risk involved in the enterprise, we are not disposed to stand in the way of such an undertaking. If, however, the state legislature when it enacted this statute was moved to do so by the belief that our finding as to public convenience and necessity would carry with it assurance that the road could be constructed within the limits of the appropriation of \$10,000,000 and would be self-sustaining, then the evidence is not sufficient to justify a finding upon our part which involves such an implication. The fact is that the evidence as to the cost of construction of the line and its probable earnings is inconclusive and unsatisfactory. There is a possibility that the line may be able to support itself, for a time at least, but the estimates of earnings have without doubt been much exaggerated. Assuming that the cost of initial construction would be wholly borne by the state, the value of the property would nevertheless be included in the aggregate value upon which, under the law, a fair return must be provided through rates. Under the circumstances we feel that we are entitled to a clearer exposition of the precise attitude of the state authorities before finally passing upon this application."

"The application will therefore be denied, but without prejudice to resubmission when it shall be deemed practicable to present a record which will substantially meet the objections stated herein."

The three routes designated in the application are: from Doughton, N. C., to Mountain City, Tenn., about 86 miles, at an estimated cost of \$9,470,000; from North Wilkesboro, N. C., to Mountain City, Tenn., about 68 miles, at an estimated cost of \$7,430,000; and from North Wilkesboro to Butler, Tenn., about 84 miles, at an estimated cost of \$8,845,000. As an auxiliary project it is proposed to construct a line from North Wilkesboro south to Taylorsville, about 23 miles. The purpose of proposing the three alternative routes, it was stated, is to develop competition for the location of the route.

I. C. C. Bus Investigation Moves to Portland, Ore.

THE railroads presented little testimony at the hearing at Portland, Ore., beginning August 7, in the Interstate Commerce Commission investigation into highway transportation and its relation to the railways. Bus and truck manufacturers, operators and shippers, however, were largely represented and testified at length as to the utility of highway vehicles, particularly of the motor truck as a carrier of freight over short distances. As in Chicago and St. Paul at the earlier hearings these witnesses deprecated the necessity of motor truck regulation of a comprehensive nature at this time. Commissioner Clyde Aitchison and Examiner E. F. Flynn, of the Interstate Commerce Commission, presided at the Portland hearing, Commissioner Esch having remained in the middle west at the conclusion of the St. Paul hearing at which he presided.

W. C. Smith, of the right-of-way and tax department of the Spokane, Portland & Seattle, was the first railroad witness, testifying regarding the public highways and the manner in which they are paid for. The expense of constructing and maintaining highways, he said, is borne by the public. H. A. Roberts, engineer maintenance of way of the Oregon-Washington Railroad & Navigation Co., filed as exhibits a number of detail maps showing the proximity of highways to the railways. As in Chicago and St. Paul, the railways showed a disposition to rest their case upon their replies to the questionnaire of the commission.

Regulation in Washington

Representatives of the Department of Public Works of the state of Washington testified that the laws of the state give the department virtually complete power to regulate the operation of motor buses and motor trucks within the state. The requirements of the department as to the securing of certificates of convenience or necessity by prospective bus and truck operators, the filing of tariffs, and the rendering of periodic reports on operations were fully described.

H. O. Berger of the Department of Public Works submitted charts showing that railways within the State of Washington obtained their maximum passenger traffic in the years 1919 and 1920 and since that time there has been a decrease of approximately one-third in passenger revenues. Since 1922 the number of passengers carried by buses in Washington has nearly doubled. L. B. Conrad, director of the Motor Vehicle Division of the Department, testified regarding the certificating of bus and truck lines in Washington. The Department, he said, has issued 465 certificates of which 232 are now in effect. Sixteen of these are for passenger lines, 104 for passenger and express lines, 6 for passenger and freight lines, 97 for freight lines and 3 for moving household goods only. A check of trucks on various roads around Seattle and Tacoma made by the Department showed a total of 716 trucks in one day of which 55 were privately owned, 401 were used for private deliveries, 138 were classed as "non-certified trucks" and 82 were certified trucks. This check showed that privately owned and operated trucks hauled nearly 75 per cent of the aggregate tonnage.

J. E. Teter, Secretary of State of Idaho, testified that Idaho has no jurisdiction over its bus lines. The state levies a tax of 5 per cent on the gross receipts of the intrastate bus lines, but has been able to collect less than 10 per cent of these taxes.

Following representatives of the western states, a number of bus and truck operators and representatives of shippers organizations testified regarding the utility of the buses. These witnesses in general presented testimony similar to that taken at earlier hearings in the investigation at Chicago and St. Paul.

The hearing at Portland adjourned on August 9 to be continued at San Francisco, Cal., on August 12.

Achievements in Railway Accident Prevention

WASHINGTON, D. C.

ONE of the most remarkable achievements in accident prevention is shown in the Interstate Commerce Commission records indicating the reduction in casualties resulting from collisions, said Lew R. Palmer, conservation engineer of the Equitable Life Assurance Society, in an address before the Industrial Accident Prevention Conference, called by the Secretary of Labor, James J. Davis, held at Washington, July 13-16. The record shows, he said, that from 1907 to 1924 there was a reduction of 81 per cent, or 85,005 on a cumulative basis, in the number of casualties resulting from railway collisions. Mr. Palmer also referred to a saving of \$116,552,190 in what he called the "wastage account" resulting from the reduction of collisions, derailments and personal injury claims in 1921, 1922, 1923 and 1924 as compared with 1920.

Statistics have played an important part in the railway safety campaign, said Mr. Palmer, stating that the accident records of the Interstate Commerce Commission afford a fund of information without parallel in any of the industries of the country and that the statistics have aided the preventionist in "selling" his safety program to the executive.

The most fertile field for preventive efforts is in the human factor in railroading, Mr. Palmer said, presenting an analysis of accident reports for the years 1920 to 1924 showing that of a total of approximately 60,000 accidents involving 13,000 casualties more than 50 per cent were chargeable to "negligence of employees." Accidents caused by negligence of employees during that period, according to Mr. Palmer, showed a decrease of 5.46 per cent, while there was a reduction of 35.79 per cent in the number of accidents due to defects in or failure of equipment. Accidents due to defects in or improper maintenance of way and structures showed a decrease of 13.34 per cent, while those due to miscellaneous causes showed a reduction of 27.89 per cent.

Referring to the action of the Safety Section of the American Railway Association at its meeting in Salt Lake City in 1924 in adopting a resolution calling for a reduction of 35 per cent by the end of 1930 in the number of casualties to persons, Mr. Palmer said that in 1925 101 Class I roads had attained their two-year quota, a 14 per cent reduction, while 30 had attained the full 35 per cent quota.

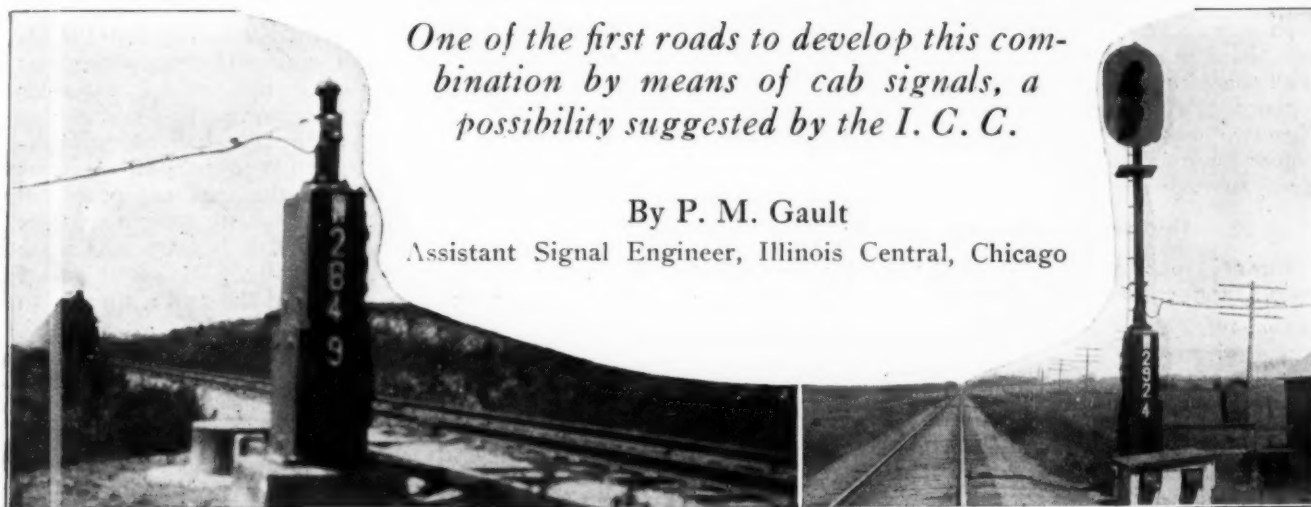
"THE VALUE OF RAILROADS TO THE COMMUNITY" which was the subject of a prize offer by the Northwestern Pacific last Spring, brought out a large number of interesting essays, and Secretary William S. Wollner announces the prize-winners as follows: First prize, Richard McLaughlin, 16 years old; second prize, Catherine Cunningham, 13 years; third, Josephine Darrow, 15 years.

Train Stop Without Permissive Wayside Signals Used on I. C.

One of the first roads to develop this combination by means of cab signals, a possibility suggested by the I. C. C.

By P. M. Gault

Assistant Signal Engineer, Illinois Central, Chicago



Train Approaching Phantom Location

Head-Block Signal on Single Track

THE Illinois Central has placed in service two locomotive divisions of automatic train stop without permissive wayside signals. These are the first complete division installations of this kind that have ever been made. One division, between Champaign, Ill., and Branch Junction (near Centralia), 122



Portable Testing Set in Roundhouse—Instrument Case Under Smokebox

miles of double track road, was made in compliance with the first order of the commission; the other division between Waterloo, Ia., and Fort Dodge, 97 miles of single track was made to comply with the second order. The Union Switch & Signal Company's continuous inductive train stop system with the permissive feature and two indication color-light cab signals is used. No automatic speed control is provided. The district between Champaign and Branch Junction was formerly equipped with automatic block signals which were removed from service when the automatic train control was installed. This double track installation involves fewer operating prob-

lems than the single track installation between Waterloo and Fort Dodge, to which the following description will be confined.

The line between Waterloo and Fort Dodge passes through an undulating prairie country with a maximum curvature of $5\frac{1}{2}$ deg. and a maximum grade of one per cent for short distances and some long grades of 0.5 per cent. The traffic consists of four regular passenger trains, one local freight train in each direction and three eastbound and two westbound scheduled freight trains over the entire territory. In addition one passenger train in each direction and two westbound and one eastbound local freight trains are operated between Waterloo and Cedar Falls, a distance of seven miles. Extra trains and sections of regular trains are operated as the traffic requires.

The trains are operated by timetable and "19 orders" in addition to the automatic train control. In the equipped territory there are seven interlocking plants and 21 passing sidings. Interlocking home signals of the semaphore type, electrically lighted, giving two indications ("Stop" and "Proceed") are used to govern movements through the plants. Prior to the installation of automatic train control no automatic block signals were in service in the district except for 13 miles from Waterloo west. These signals have been removed.

Absolute Signals Located at Leaving End of Passing Sidings, Others Are Phantom Locations

One two-indication color-light signal is located in advance of the exit end of each passing siding. The indications of this signal are green for proceed, and red for stop. Circuits are arranged so that for opposing moves this signal shows red when a train passes the opposing signal at the next siding while for following moves it changes from red to green when a train passes the first phantom location in advance of the passing siding. The sole function of this signal is to inform the engineman whether he may proceed. When a train is stopped by a stop signal it must stay until authorized to proceed, or

in case of a failure or lack of communication it may proceed when preceded by a flagman. The engineman is required to govern the speed of his train in accordance with the indication of the cab signal.

The track between the passing sidings is divided into sections or blocks, the length of which is not less than braking distance. These block points are called, for convenience, phantom locations, being the locations at which signals would be installed if signals were used. Each phantom location is the "B" point for the next signal or phantom ahead for following movements. Station to station blocking is effective for opposing movements. When two opposing trains approach a meeting point each receives a red cab signal at the first phantom location in rear of the meeting point.

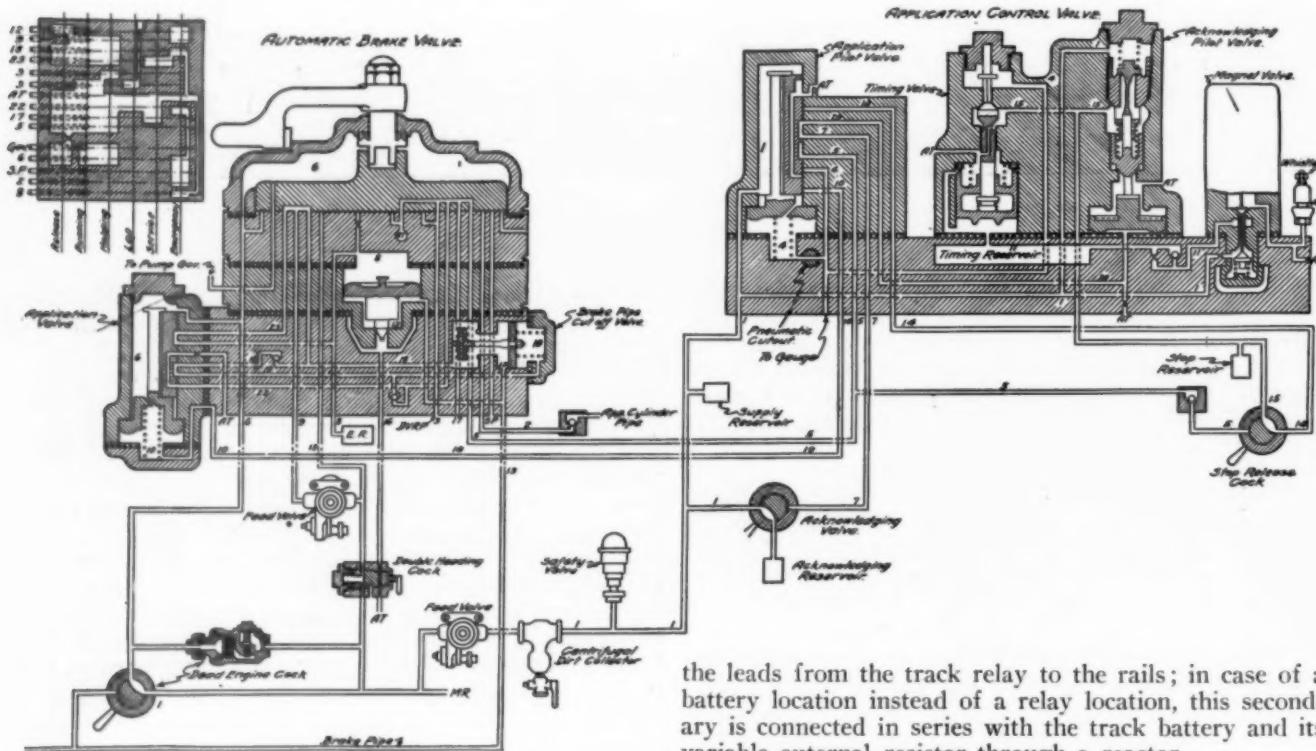
Power Supply and Circuits

Power is purchased from public service companies serving the territory and transmitted at 550 volts single

when a track circuit is occupied the charge is cut off to insure against improper operation of locomotive equipment due to pulsating charging current. Wherever power is taken from the line a 550-110 volt transformer with lightning arresters and plug cutouts is mounted on the cross-arm of the pole line.

Roadside Train Control Circuits

Alternating current at 110 volts is carried into the instrument housing through a cable line drop where it is stepped down to six volts through a small transformer known as the reset loop transformer. The secondary of this transformer is connected through the recurrent acknowledgment loop in series, to the primary of the reset check transformer which steps the current up to 110 volts. This 110 volt current is taken through contacts of the control relays after which it is impressed upon the primary of the track transformer. The secondary of the track transformer is connected through a resistor to



Pneumatic Diagram of Automatic Train Stop Equipment on Locomotive

phase on two No. 6 A.W.G. weatherproof copper wires carried on the end pins on the track side of the lower cross-arm of the telegraph pole line. Each cross-arm is stenciled "Danger 550 Volts" immediately below these wires. Transpositions are made to prevent interference with the communication circuits. Nine automatic substations control the supply of current for the system. The substation equipment is operated so that each alternate station is either a preferred or emergency source of power. In case of a failure of power at any station the adjacent stations either way, will cut in automatically and serve the territory for which the station has failed. Once cut in, a station will continue to feed until it fails or the service has been restored to an adjacent station manually.

Track circuits longer than 4,000 ft. are center-fed with one cell of lead type storage battery. Storage cells are trickle charged through electrolytic rectifiers from the a-c. power line. A special circuit is employed so that

the leads from the track relay to the rails; in case of a battery location instead of a relay location, this secondary is connected in series with the track battery and its variable external resistor through a reactor.

The recurrent acknowledging loops are provided to require recurrent acknowledgment by the engineman at successive stop blocks. Being in series with the transformers which feed the track circuits in the rear, a broken loop circuit results in the cutting off of energy from the track circuit approaching the location. The loop is made up of $\frac{3}{8}$ in. copper weld strand stapled to the top of the ties about six inches inside of the base of the rail, extending 50 ft. either way (200 ft. of wire) from the block location.

Parkway cable has been used in all new work throughout the installation. The track wiring is single conductor No. 9 A.W.G. and the circuits from instrument cases on the line side to the apparatus across the track are carried in four conductor No. 9 A.W.G. parkway cables. All main track switches are equipped with two shunt boxes, one connected to each switch point. Lifting type derrails on all turnouts, except passing sidings, are also provided with shunt boxes. Telephone communication has been provided at each passing siding where the indication of the leaving signal can not be seen from the telegraph office at the station.

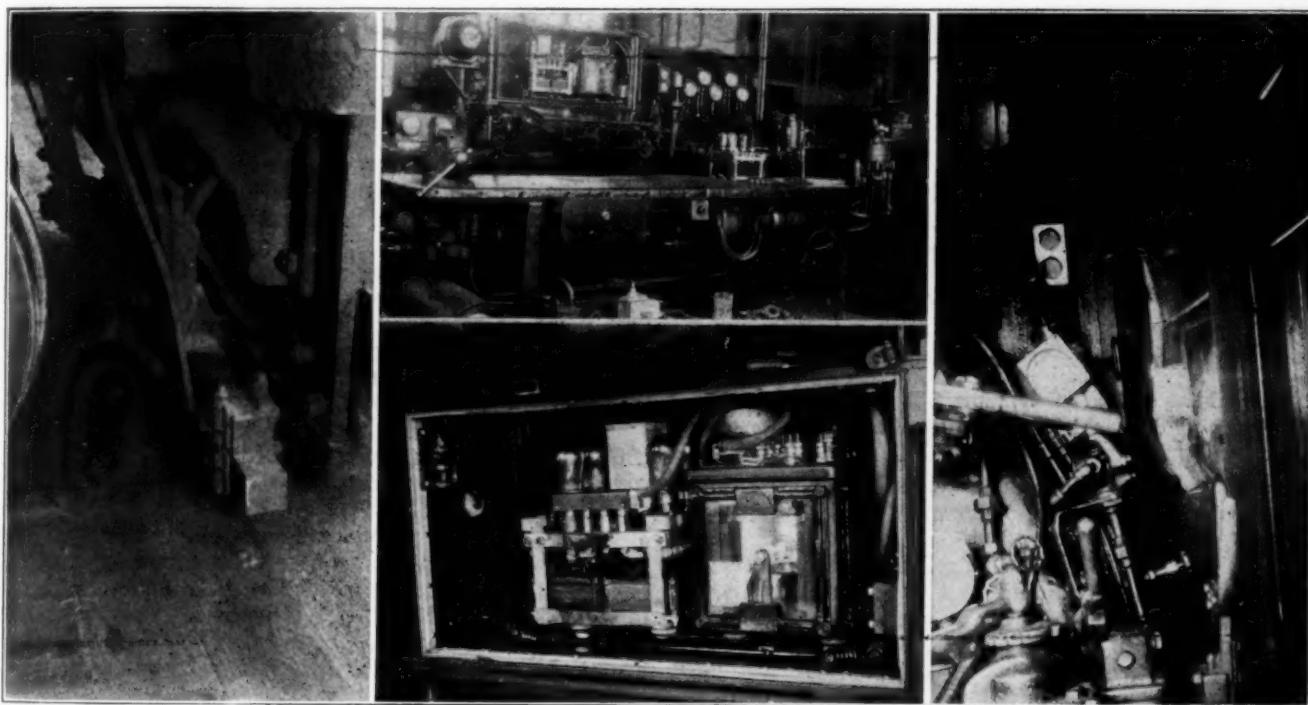
Locomotive Train Control Equipment

Thirty-eight locomotives, 10 passenger and 28 freight, have been equipped. Four additional passenger locomotives assigned to the territory west of Fort Dodge are now being equipped for emergency service. Two switching locomotives working between Fort Dodge and Gypsum have been equipped for operation in either direction while all of the remaining locomotives have been equipped for forward movement only. The locomotive equipment consists of receiver coils, relay, amplifying unit, dynamotor, brake application valve group, pneumatic circuit controller, acknowledging valve, reset cock, cab signal and voltmeter together with necessary wiring and piping.

The receiver coils are mounted ahead of the forward engine truck so that they clear the running rails about six inches. The windings of these coils are connected so that they are additive for rail current flowing in opposite directions in the rails. Power for the locomotive

The cab signal giving two indications, red or green, is mounted on the front wall of the cab on the engineman's side so that it is in his line of vision. A voltmeter mounted on a bracket on the side of the boiler indicates the voltage being delivered by the headlight generator. The reset cock is located outside of and underneath the cab where it cannot be reached except from the ground, thus insuring that a stop must be made before the brakes can be released following an automatic application.

The engineman's automatic brake valve is similar to the H-6 except that two small valves, part of the automatic brake system, are included. One of these, the brake pipe cutoff valve, lies within the pipe bracket casting while the application valve uses the position that the feed valve occupies with the Type-A pipe bracket; the feed valve is mounted separately. The space occupied by the new engineman's valve is substantially the same as the H-6 with the feed valve attached so that the existing clearance is not reduced. A small whistle con-



Collector Coils Mounted Beneath the Pilot

Above—Test Rack in Roundhouse
Below—Case Mounted Under Smokebox

Cab Signal and Voltmeter to Left
Cut-out Switch Upper Right

apparatus is supplied by the headlight turbo-generator. The relay and amplifying unit are enclosed in a sheet metal box suspended from the smokebox and the dynamotor which furnishes the plate current is mounted on a bracket on the end of this box. Wires between the cab and the equipment box are carried in the hand rail on the right side of the boiler; headlight wires are carried in the left hand rail. The brake application group is located underneath the engineman's seat box where it is protected from freezing.

The pneumatic circuit controller is mounted on the outside of the cab to the left of the door leading to the right hand running board. The acknowledging valve located on the wall of the cab within convenient reach of the engineman, is provided so that he may, if alert, forestall an automatic application of the brakes. To be effective this valve must be operated less than 10 seconds previous to a change in the cab signal indication from green to red and not more than six seconds after this change.

necting to the exhaust port of the magnet valve provides an audible warning of a change in indication. A long blast of this whistle is sounded when the cab signal changes from green to red and a short blast when the change is from red to green, thus giving ample warning for the engineman to operate the acknowledging valve.

A manual emergency brake application may be made at any time regardless of whether an automatic brake application has been initiated. When locomotives are double-headed the automatic stop equipment, except on the leading locomotive, is automatically cut out of service by closing the double heading cock on the second locomotive. This does not prevent a manual emergency brake application being made on the second locomotive at any time.

Thorough System of Roundhouse Tests

Eliminates Trouble on the Road

Test loops are provided at locomotive terminals to facilitate the testing of locomotives immediately on ar-

rival and prior to departure. After-trip test loops are located at the inspection pit where every locomotive is met by a train control inspector who takes the engine-man's report and makes a complete test and inspection of the equipment, entering all data on the proper form. These forms are bound in a book which contains 50 sets, a set consisting of the original, a yellow sheet which is bound solid in the book and remains in the book in the test house at the pit, and the two tissue sheets which are carbon copies and are perforated for easy removal. One of these is for the supervisor of automatic train control, the other for the division electrical foreman. Pit electricians report on these forms all engines they handle in and out, whether equipped with train stop or not.



Acknowledging Valve on Window Sill and Brake Application Valve Group with Engineman's Seat Box Removed

These reports also include a statement of all work done on the engines and a brief statement of any trouble sustained by engines on the road.

A portable test set is provided for making tests on locomotives in the roundhouse. This set includes all apparatus necessary to make a complete test of locomotive equipment, including emission tests of amplifying tubes. A motor generator set for converting 110 volts a-c. into 30 volts d-c. is included in the set. A plug receptacle in

the cab and a long cable with plug is used to connect the 32 volt d-c. generator to the train control circuit when the headlight generator is not operating. A track transformer in the set, connected to wires mounted on small grooved pieces of lumber which may be placed under the receiver coils, furnishes the necessary track circuit energy. With this outfit an engine may be tested "cold" in any stall of the roundhouse where 110 volt a-c. is available to operate the set. In addition to the portable test sets one complete locomotive equipment has been set up on a rack for testing individual pieces of apparatus and for instruction purposes. Air and electrical energy are supplied to this rack so that operating conditions may be duplicated exactly.

Two departure test loops are located where it is necessary for an engine to be run over them before coupling to a train. In passing over one of the loops the engine-man does not acknowledge and an automatic brake application and stop results, at the other he acknowledges the change of the cab signal and proceeds without an automatic brake application to pick up his train. Just before entering train control territory a short permanently energized track section has been installed to clear the cab signal and put the equipment in condition.

Train Control Operation

While carrying a green cab signal a train may proceed at authorized speed. Immediately upon a change from green to red, the engineman is required to reduce speed and proceed at not exceeding 15 miles per hour. If for any reason the equipment fails or a red indication persists the fact must be reported to the dispatcher at the first point-of communication. A pneumatic cut-out is provided for use in case of an electrical failure and the engineman may in an emergency cut out the train control system pneumatically by reversing the cut-out lever which is sealed in the cut-in position. The electrical equipment may operate when the condition which caused its failure is removed, regardless of the position of the cut-out lever.

When necessary to run non-equipped locomotives or to detour foreign line trains over automatic train control territory they are double-headed with an equipped locomotive coupled ahead. The roadside equipment is maintained by the signal department forces while the locomotive carried apparatus is maintained by mechanical department forces.



Erie Locomotive No. 2495—Originally Built for the Russian Railways

Standardization and Specifications Vital to Better Purchasing

*Clear understanding of principles, a helpful
guide in meeting the present day problems*

By N. F. Harriman



The following article is the second by the author on standardization, the first having been published in the issue of January 23. The present article touches on its evolution as an appropriate background for the understanding of the subject and its possibilities, and dwells further on the subject of specifications. The author is qualified to discuss this and related subjects affecting railway purchasing and material control. He was formerly engineer of tests of the Union Pacific, and otherwise prominently associated with railway purchasing, and has been associated with the Bureau of the Budget of the United States since its establishment, being a member of the Federal Purchase Board and vice-chairman of the Federal Specifications Board, under which 75 technical committees are constantly at work drafting the standards for federal purchases. In view of Mr. Harriman's present connection with the government, it is emphasized that neither this nor future articles by the author are associated in any way with the publicity activities by the government on standardization or similar subjects, but represent solely the personal views of the author.—Editor.

BEFORE standardization can be accomplished properly and effectively, it is important that a clear understanding of standardization should prevail. Early in the nineteenth century, manufacturing in the United States began on a considerable scale, patterned essentially on European lines, but there were relatively narrow markets. These markets were broadened during the first half of the nineteenth century by improved transportation facilities, but national distribution could not yet be attempted. Scientific methods had not begun to be utilized and modern accounting methods were not yet to be developed. At this stage in manufacture, the need for purely manual skill was beginning to be subordinated to the development of the dexterity in the human operator required for the continuous operation of highly specialized machines. Industrial progress thus consisted largely in the continuous advance toward a greater measure of what is known as standardization.

The next stage saw the United States rise from a relatively insignificant position to that of one of the great industrial and manufacturing nations of the world, both in quantity and diversity of product. As production increased, economies in the purchase of raw materials became possible with integration of the various steps in the production of materials and the manufacture of more and more refined products. Mechanical

standardization spread from one process to another in the same industry, and from one industry to another, and gradually it was found that machines, adjusted to standardized work, helped one another because of the uniformity of the product. So progress went on cumulatively. Each step forward made the next simpler, and by slow steps there were evolved the fundamental notions of those semi-automatic and automatic machines of the present day, each of which performs a great many operations one after another on the material fed into it. Thus, the gaps which had to be filled in by hand work constantly became fewer and shorter. As manufacturing grew and industries became larger, there was developed the "American type" of manufacturing standardized interchangeable parts.

In the latter part of the nineteenth century the era of simple consolidations in industry began. This was brought about by destructive competition, by the profitableness of promoting these combinations and for economic reasons.

As industries developed, they embraced much wider territories. Problems of exchange and transportation arose, finance became much more complicated. Men began to talk about the "business cycle." Traffic managers were created. Great credit organizations and enormous banking institutions arose.

Today's era is that of super-consolidation in industry and transportation, the most highly developed form of industrial evolution, symbolic of a changing economic order. Pooled resources of capital, brains, machinery and muscle make possible an accelerated improvement in the industrial process. Even more impressive are the wastes which are eliminated from the methods and processes of manufacture. The entire business of production is geared as one inter-connecting machine, to the demand for the finished product. Not only is there co-ordination associated with super-consolidations of industry, but there is balance and stability. The entire structure of our industrial and business life is entering this new stage of development.

The formation of super-consolidations of railroad groups, with the inevitably resulting economies of highly standardized and co-ordinated operation, will undoubtedly be the next step in this economic drama. We are now on the verge of this stage of evolution in transportation.

Scientific management of these gigantic industrial groups, both manufacturing and transportation, with budgetary control, co-ordinated effort and highly stand-

ardized operation, are indispensable to their progress and security.

The National Bureau of Standards, which is recognized as the most authoritative source of information in this country on standards and standardization, has for its functions the development, construction, custody and maintenance of standards, and their inter-comparison, improvement and application to science, engineering, industry and commerce. Standardization is defined by the Bureau of Standards as the unification of the methods, practices, and technique involved in manufacturing, construction and in all lines of endeavor which present the necessity of performing repetition work. From the viewpoint of the buyer and seller it is the establishment of a criterion for the dimensions, quality, or performance of apparatus, materials and commodities. In its latter aspect its purpose is principally to assist in establishing a common understanding between manufacturer and consumer. In its former aspect it tends to promote scientific and engineering development and to prevent waste in manufacturing.

Standardization is arrived at by continuous research to establish in units of measure an evaluation of the several factors which will give the maximum feasible utility to materials, devices, or processes. This also includes the establishment of allowable variations from specified measurements, liberal enough for economy of production, close enough for efficient functioning and effective interchangeability. In the final step, the interests of various business concerns are considered in order to obtain an acceptance of the standard in commerce. Thus standardization primarily means setting up of standards by which the extent, quantity, quality, value, performance or service may be gaged or determined. It is the crystallization of the best thought and practice of industry and business into definite forms for general usage.

From a broad viewpoint, standardization may be applied to men, materials, methods, products, and uses. With reference to material it is the principle of standardization that the raw materials used in the manufacture of a product must be of standard and uniform quality, if the process of manufacture and the grade of the product are to be maintained.

With reference to methods the principle is that a product made continuously from standard grade material more readily permits standardization of each step in the process of production, than if the quality is of variable grade. This is attained by the adoption of the one best and most economical method of doing each thing as taught by plant and engineering experience, and making it standard practice.

With reference to the product, the principle is that a standardized product, made to definite specifications, permits an output to the maximum uniformity possible within the limits of manufacturing skill. A uniform product made and sold continuously permits a steady production schedule, a building up of stocks during periods of low demand, and their depletion during periods of high demand. Without a standardized basis, the only alternative is to follow the "hand-to-mouth" method. The standardized product is manufactured to meet definite wide needs, according to precise specifications, and is constantly tested to insure its conforming to standard grade.

With reference to the use of material, finally, it is recognized that one type, grade, shape, or size of an article will not meet all the requirements of the consumer, neither is it desirable to have such an extensive variety that the differences are small and meaningless. The ideal condition is to have just enough variety to meet all the real needs with no overlapping.

The economies and benefits of standardization have been so thoroughly demonstrated within the past few years that they are entirely outside the argumentative field. Objectors frequently urge that it stifles initiative and progress and that the adoption of a standard prevents advance through improvements in the arts of manufacture. Of course, this is not the case. A standard should remain standard only until something better is developed, but it should not be changed until justified from all points of view. Any given standard, to achieve its object, must be suitable for the intended use in the majority of cases. The exceptional case requires special consideration, and actual perfection will never be attained.

One of the greatest business needs is the standardization of definitions of scientific and technical words, terms, phrases, abbreviations, symbols, and diagrams. Standardization of these elements of our technical language is fundamental in importance. It is very important that there be acceptable definitions of the terms used in specifications and contracts because it enables purchaser and producer to use and understand the same language. Some progress has been made in this field, but there is still a very wide diversity of usage.

Specifications Essential

Standardization of variety, or simplification on the other hand, involves the elimination of unnecessary types, grades, shapes and sizes of manufactured articles. In this case the basic principle is that a single item of material shall serve for as many different purposes or for as many different classes of equipment and kinds of construction as possible. While much progress has been made in this direction, it must be admitted that neither is this principle yet functioning to any satisfactory degree.

It is recognized, for instance, that on railroads store stocks are inflated because of too many sizes and kinds of raw material and supplies, too many designs of car and locomotive parts performing the same function on different classes of equipment, and too little interchangeability between different makes of proprietary articles and devices.

Among the economies in this field is more economical purchasing that arises from the use of a smaller number of items ordered, with the consequent increase in the quantity per item. Also from the eventual reduction of manufacturing costs, and the elimination of special material which involves higher prices and longer delivery periods. Another result is the greater economy in book-keeping and the better control of stock, which are inversely proportional to the number of items involved. Simplification is also productive of quicker turnover and smaller stock balances, because a single item of material protects a greater number of requirements; less tendency to frozen stock with the attendant deterioration, obsolescence and probability of eventual scrapping because of its special nature; less store house space and consequently more convenient and economical arrangement of stock; and finally, less danger of the undesirable condition of repair work delayed due to lack of material. The capital charges carried on unnecessarily large stocks makes standardization of variety of the greatest economic importance.

It is standardization of quality, or specifications, however, that especially calls for emphasis from the standpoint of the purchaser and user. The term quality as applied to industrial products, and as defined by the specification, means those characteristics which distinguished the goods of one manufacturer from those of another. Quality serves to identify an article, and indicates the uniformity of a specific grade of article.

The best way to get desired quality is by the use of adequate specifications.

Previously in the columns of this publication a suitable specification was described by the writer as one which enables bidders to know exactly what is desired or required and what procedure the purchaser will follow to satisfy himself that the specification has been complied with, and it was stated that defective and incomplete specifications, whether due to compromise of quality for temporary economy, or through lack of data, should be replaced by those in which the best magnitude of each property involved is so specified as to predetermine the definite quality best meeting the need.

In the same article the point was also made that satisfactory specifications are the result of growth and must change from time to time, to harmonize with the changes in both the methods of manufacture and the requirements of the service, and that they can develop only as the area of definite knowledge expands,—a consideration which makes apparent the importance and necessity of continuous study in their formulation.

In this discussion it should also be re-emphasized that a specification is of value only to the extent to which its provisions are enforced by fair and uniform inspection.

Unless enforced it is valueless and becomes a dead letter. Its fair enforcement is a benefit alike to the honest purchaser and seller and a stumbling block to those on either side who desire to resort to subterfuge or deception. Furthermore, it must be enforced uniformly at all times to be effective.

The purchase of materials and products in accordance with well-defined standards, understood and agreed upon by the producer and enforced by the buyer, is the only way by which they can be purchased successfully by competitive bids.

The tendency of modern purchasing is undoubtedly toward complete specifications. This tendency toward complete specifications and away from the use of terms "equal to sample," or according to trade name, catalog reference, etc., is undoubtedly due to the increase of testing laboratories. Purchasing on sample is a makeshift of the poorest sort. It is true that certain qualities and properties cannot be described adequately in words, but in such cases, the reference to the standard sample should be limited to those characteristics which cannot be described verbally. Examples of these are color, texture, finish, etc.

Standard specifications frequently must be made to conform to recognized trade specifications as the cost of special fabrication will be excessive. In setting standards for materials, it is ordinarily wise and economical to choose between articles that are commercial and readily secured, unless very large quantities are required, and the conditions of use extraordinary.

In embarking upon a consistent standardization program, the first problem is the selection from among the enormous number of items purchased, of those for which standardization and specifications shall first be attempted. Obviously those items involving the largest amounts of money, or those which are of the greatest importance in the operation of the property, should first be standardized. On a railroad, of course, these items range from locomotives and cars down to office supplies. The next step consists in drafting a tentative specification, in conference with representatives of the departments by which the articles in question are to be used. Representative manufacturers should also be consulted. The friendly clash of opinions between manufacturers and users of goods is very often most enlightening to anyone concerned in the development of standard specifications.

Because of the importance of specifications, the writer finds no way of emphasizing and perhaps clarifying the views expressed in this and his earlier discussion than by referring to the following conclusions on the formulation of specifications found in a former address of the president of the American Society for Testing Materials, which are none the less timely though presented as long ago as 1903.

1. A specification for material should contain the fewest possible restrictions, consistent with obtaining the materials desired.
2. The service which the material is to perform, in connection with reasonably feasible possibilities in its manufacture, should determine the limitations of a specification.
3. All parties whose interests are affected by a specification should have a voice in its preparation.
4. The one who finally puts the wording of the specification into shape, should avoid making it a place to show how much he knows, as well as a mental attitude in favor of, or antagonism to, any of the parties affected by it.
5. Excessively severe limitations in a specification are suicidal. They lead to constant demands for concessions, which must be made if the work is to be kept going, or to more or less successful efforts of evasion. Better a few moderate requirements rigidly enforced, than a mass of excessive limitations, which are difficult of enforcement, and which lead to constant friction and sometimes to deception.
6. There is no real reason why a specification should not contain limitations derived from any source of knowledge. If the limitations shown by physical test are sufficient to define the necessary qualities of the material, and this test is simplest and most easily made, the specifications may reasonably be confined to this. If a chemical analysis or a microscopic examination, or a statement of the method of manufacture, or information from all four, or even other sources, are found useful or valuable in defining limitations, or in deciding upon the quality of the material furnished, there is no legitimate reason why such information should not appear in the specifications. Neither the producer nor the consumer has a right to arrogate to himself the exclusive right to use information from any source.
7. Proprietary articles and commercial products made by processes under the control of the manufacturer cannot, from the nature of the case, be made the subject of specifications. The very idea of a specification involves the existence of a mass of common knowledge in regard to any material, which is more or less available to both producer and consumer. If the manufacturer or producer has opportunities, which are not available to the consumer, of knowing how the variation of certain constituents in his product will affect that product during manufacture, so also does the consumer, if he is philosophic and is a student, have opportunities not available to the producer, of knowing how the same variation of constituents in the product will affect that product in service, and it is only by the two working together, and combining the special knowledge which each has, that a really valuable specification can be made.
8. A complete workable specification should contain the information needed by all those who must necessarily use it, in obtaining the material desired. On railroads this may involve the purchasing agent, the manufacturer, the inspector, the engineer of tests, the chemist, and those who use the material. A general specification may be limited to describing the properties of the material, the method of sampling, the amount covered by one sample, and such descriptions of the tests as will prevent doubt or ambiguity.
9. Where methods of testing or analysis or inspection are well known and understood it is sufficient if the specification simply refers to them. Where new or unusual tests are required, or where different well-known methods give different results, it is essential to embody in the specification sufficient description to prevent doubt or ambiguity.
10. The sample for test representing a shipment of material should always be taken at random by a representative of the consumer.
11. The amount of material represented by one sample can best be decided by the nature of the material, its importance, and its probable uniformity, as affected by its method of manufacture. No universal rule can be given.
12. The purchaser has a right to assume that every bit of the material making up a shipment, meets the requirements of the specification, since that is what he contracted for and expects to pay for. It should make very little difference, therefore, what part of the shipment the sample comes from, or how it is taken. Average samples made up of a number of samples, are only excusable when the limits of the specification are so narrow that they do not cover the ordinary irregularities of good practice in manufacture.

13. Retests of material that has once failed should be asked for only under extraordinary conditions, and should be granted even more rarely than they are asked for, errors in the tests of course excepted.

14. Simple fairness requires that when it is desired that material once fairly rejected should nevertheless be used, some concession in price should be made.

15. Where commercial transactions are between honorable people, there is no real necessity for marking rejected material, to prevent its being offered a second time. If it has failed once, it will probably fail a second time, and if return freight is rigidly collected on returned shipments the risk of loss is greater than most shippers will care to incur. Moreover, it is so easy for the consumer to put an inconspicuous private mark on rejected material, that it is believed few will care to incur the probable loss of business that will result from the detection of an effort to dispose of a rejected shipment by offering it a second time.

16. All specifications in actual practical daily use need revision from time to time, as new information is obtained, due to progress in knowledge, changes in methods of manufacture, and changes in the use of materials. A new specification, that is, one for a material which has hitherto been bought on the reputation of the makers and without any examination as to quality, will prove unusual if it does not require revision in from 6 to 10 months after it is first issued.

17. In the enforcement of specifications, it is undoubtedly a breach of contract legitimately leading to a rejection, if the specified tests give results not wholly within the limits, and this is especially true if the limits are reasonably wide. But it must be remembered that no tests give the absolute truth, and where the results are near, but just outside the limit, the material may actually be all right. It seems better, therefore, to allow a small margin from the actual published limit, equal to the probable limit of error in the method of testing employed, and allow for this margin in the original limits, when the specifications are drawn.

18. Many producers object to specifications on the ground that they are annoying and harassing, and really serve no good purpose. It is to be feared that the complaint is just, in the cases of many unwisely drawn specifications. But it should be remembered that a good, reasonable specification, carefully worked out, as the result of the combined effort of both producer and consumer, and which is rigidly enforced, is the best possible protection which the honest manufacturer can have against unfair competition.

19. Many consumers fear the effect of specifications on prices. Experience seems to indicate that after a specification has passed what may be called the experimental stage, and is working smoothly, prices show a strong tendency to drop below figures prevailing before the specifications were issued.

20. A complete workable specification for material represents a high order of work. It should combine within itself the harmonized interests of both the producer and the consumer; it should have the fewest possible requirements consistent with securing satisfactory material; should be so comprehensive as to leave no change for ambiguity or doubt, and above all should embody within itself the results of the latest and best studies of the properties of the material which it covers.

The Advantages are Many

Standardization is unquestionably the proper basis for efficiency in purchasing. It particularly minimizes the difficulty of comparing values and of obtaining materials in accord with complex and widely varying requirements. The smooth functioning of an industry depends upon the receipt of material when and where needed, while economy in operation demands that capital tied up on purchased material be held to the minimum consistent with uninterrupted supply. Purchasing executives and buyers are often confused with the needless extent and variety of commodity lines. Excess varieties, which are often developed merely for their selling points, are the source of needless waste.

Standardization also enables buyer and seller to use the same language. It promotes fairness in competition by putting bids on an easily comparable basis. It gives the buyer a wider choice of firms to bid. Moreover, everyone who has had experience in purchasing or selling knows that a manufacturer or a jobber almost invariably quotes lower prices on large than on small quantities of his goods. By concentrating the purchases for a given article there would undoubtedly be obtained a consider-

able concession in price on the part of the manufacturer or jobber. Manufacturers are often willing and anxious to deal direct with consumer when large quantities are involved, but it would not be worth while for them to consider only a few small orders. Where supplies are purchased in small quantities at retail or even from wholesale dealers, the price paid ordinarily includes not only the manufacturer's profit but likewise the commission and handling expense of one or more middlemen. If purchases reach large proportions, it would in most cases be entirely feasible to deal direct with the manufacturer and in other cases to pay not more than one middleman's commission and save also some corresponding expenses in connection with shipping and handling. The prestige in advertising which would accrue directly or indirectly to any manufacturer or jobber who secured such a large business, would stimulate him to make low prices and at the same time to give good service. In reflecting upon the advantages of standardization it should also be considered that manufacturers of standardized goods can produce them in slack season, thus enabling them to resume deliveries immediately on revival of demand, and finally, that attention is centered on quality as well as price.

Lack of standards of quality, or specifications, together with inadequate testing and inspection, is costing the business interests of this country large sums each year, but this can be corrected by centralized purchasing, based on properly prepared and enforced specifications. The principles involved are fundamental and have only begun to produce their possible dividends not only in the mechanical phases of business but in the buying and selling phases as well.



First Locomotive to Enter Edmonton, Alta. (November 24, 1905), Presented to Municipality by the C. N. R. as a Permanent Exhibit

Accident Investigations, Fourth Quarter, 1925

THE Interstate Commerce Commission has issued its quarterly summary of accident investigations (No. 26) for the three months ending with December, 1925. This bulletin covers 22 collisions and 20 derailments. The government reports dealing with some of these accidents have already been abstracted in the *Railway Age*, as noted below. A partial abstract of the bulletin is given in this article. Several of the accidents, of comparatively less importance, are omitted from this article because of limitation of space.

The complete list as shown in the index of the official publication is as follows:

ACCIDENTS INVESTIGATED, OCTOBER, NOVEMBER AND DECEMBER, 1925*

1194 Southern	Rutherfordton, N. C. ..	Oct. 1	D
1195 Atlanta Birmingham & Atlantic	Parkwood, Ala.	Oct. 3	D
1196 Houston & Texas Central (Southern Pacific Lines) ..	Bryan, Tex.	Oct. 4	C
1197 Florida East Coast	Eau Gallie, Fla.	Oct. 4	C
1198 Lehigh Valley	Geneva Junction,	Oct. 5	D
1199 Southern Pacific	Sparks, Nev.	Oct. 6	C
1200 New York, New Haven & Hartford	Glenbrook, Conn.	Oct. 6	D
1201 Virginian	Rock, W. Va.	Oct. 8	C
1202 New York Central	Helle Isle, N. Y.	Oct. 9	C
1203 Pennsylvania	Ellendale, Del.	Oct. 10	D
1204 Atlantic Coast Line	Mango, Fla.	Oct. 10	C
1205 Oregon-Washington R. R. & Nav. Co. (U. P. System) ..	Blalock, Ore.	Oct. 10	D
1206 Pennsylvania	Seward, Pa.	Oct. 14	C
1207 Pennsylvania	Warwood, W. Va.	Oct. 14	D
1208 Houston & Texas Central (Southern Pacific Lines) ..	Alma, Tex.	Oct. 15	C
1209 Central of Georgia	Broughton, Ga.	Oct. 15	D
1210 Southern	Danlboone Yard, Va. ..	Oct. 16	D
1211 Georgia Southern & Florida (Southern Railway System) ..	Clinchfield, Ga.	Oct. 18	C
1214 Baltimore & Ohio	Uhrichsville, O.	Oct. 28	C
1215 Lehigh Valley	Oakwood, N. Y.	Oct. 31	D
1216 New York, Chicago & St. Louis	Erie, Pa.	Nov. 1	D
1217 Alton, Granite & St. Louis Traction	Nameoki, Ill.	Nov. 2	C
1218 Los Angeles & Salt Lake (Union Pacific System) ..	Vigo, Nev.	Nov. 3	D
1219 Atlantic Coast Line	Rockelle, Fla.	Nov. 5	C
1220 St. Joseph Belt	St. Joseph, Mo.	Nov. 11	C
1221 Pennsylvania	Menmouth Jct., N. J. ..	Nov. 12	C
1222 Chicago, Milwaukee & St. Paul ..	Sacred Heart, Minn.	Nov. 15	C
1223 Western Maryland	Mount Savage, Md.	Nov. 15	D
1224 Northern Pacific	Olympia, Wash.	Nov. 17	D
1225 Atlanta Joint Terminals ..	Atlanta, Ga.	Nov. 22	C
1226 Atlanta, Birmingham & Atlanta	Westover, Ala.	Nov. 26	D
1227 Pennsylvania	Altocna, Pa.	Nov. 29	D
1228 Atlantic Coast Line	Trilby, Fla.	Dec. 1	C
1229 Georgia Southern & Florida (Southern Railway System) ..	Fargo, Ga.	Dec. 11	D
1230 Missouri Pacific	Milo, Mo.	Dec. 12	D
1231 Atlantic Coast Line	Maitland, Fla.	Dec. 16	D
1232 Pennsylvania	Gallitzin, Pa.	Dec. 19	D
1233 Chicago & Alton	Booth, Mo.	Dec. 20	C
1234 Atlantic Coast Line	Moncks Corner, S. C.	Dec. 24	C
1235 St. Louis-San Francisco	Osceola, Ark.	Dec. 25	C
1236 New York Central	Wallaceton, Pa.	Dec. 26	C
1237 Ft. Worth & Denver City ..	Fort Worth, Tex.	Dec. 27	C

* Summary No. 25, July, August and September, 1925, was reported in the *Railway Age* of July 10, 1926. Page 65.

Southern, Rutherfordton, N. C., October 1, 1925—A work train, crossing a trestle at 15 miles an hour was derailed by the breaking of a truck under a coal car, and this car and the locomotive fell off the trestle; engine-man, fireman and foreman killed; 11 employees injured. The failure of the truck was due to the fracture of the truck frame, originating at the inner angle of the axle-box jaw. The report classes the accident as an avoidable one. Blowholes were present in the frame. The core had not been placed centrally in the casting, and there was a deficiency of metal at a vital place.

Atlanta, Birmingham & Atlantic, Parkwood, Ala., October 3.—Westbound freight train extra 103 consisting of four cars and a caboose, hauled by engine 103, moving backward, was derailed and ditched, and the

engineman, fireman and one brakeman were killed. The inspector believes that the derailment was due to the defective condition of the front tender truck, coupled with irregularity in the track. One side-bearing of the tender had been lost off, from some cause not discovered; this, with a low joint and irregular gage, is believed to have caused excessive rocking of the tender. The investigation developed that the force of trackmen was not sufficient to maintain the track properly, and it is remarked that "Such a situation was not conducive to the safe movement of trains."

Lehigh Valley, Geneva Junction, N. Y., October 5, 6:27 p. m.—Westbound express passenger train No. 9, consisting of locomotive No. 2057 and 12 cars, moving at about 45 miles an hour, was thrown off the track by an automobile which, driven by a reckless driver, struck the tender, at the side, at a highway crossing and did such damage as to cause the tender to jump the track. The train about 2,200 feet, when the rear tender truck became detached and four cars were derailed. Two men in the automobile were killed and a third was injured; but the report makes no mention of injuries to persons on the train. The driver of the automobile was a state trooper who, when interviewed "could not recall anything as to how the accident occurred." Although the whistle and bell had been sounded on the locomotive and although the crossing is well equipped for warning drivers on the highway and there is an unobstructed view, the present report says that as there is a large amount of travel over the crossing "it is believed that some form of protection in addition to that afforded by the crossing signs and the painted lines across the highway is required"; although in this case there is no assurance that such additional safeguards would not also have been disregarded.

Southern Pacific, Sparks, Nev., October 6, 8:28 p. m.—Westbound passenger train No. 5, moving at about 20 or 25 miles an hour, ran over a misplaced switch and into the head of a freight train standing on the icing track, wrecking both locomotives and making a bad smash-up; the engineman and fireman of the passenger train were killed and nine passengers were injured. A yardman, not very familiar with the yard, though experienced at other places, had left the switch in the wrong position. A long siding east of the point of derailment north of the main track was mistakenly supposed by this man to be a main track and he was expecting the passenger train on that track. He had not remained in the vicinity of the switch as he should have done and so, when he ran to straighten it, after seeing the approach of No. 5, he was too late. He had walked a short distance east to watch some trespassers. He swung his lantern, however, to stop No. 5 and said that this signal was not heeded. The engineman of No. 5 is held at fault on this account, and also for not having seen the red light at the misplaced switch; furthermore, Rule 93 applies at this point, and all trains should be run under control. The fireman is therefore blameworthy, also. Further, says the report "there is a possibility that the local officers are at fault for their failure to see that Yardman Warnock was properly instructed." One of the assistant yardmasters had a wrong understanding about the use of the long siding east of the switch. There are auto-

matic block signals on this line, east of Sparks, but this protection ends 1,700 ft. east of the switch which was left wrong.

Virginian, Rock, W. Va.—Work train extra No. 460 moving westward at about 15 miles an hour, collided with work train 442 moving eastward at about one mile an hour, or less, and three employees in the caboose of 442 were killed; two other employees were injured. The line of road is very crooked and the collision occurred on a curve of eight degrees where the engineman of 460 had no view ahead. The two work trains had just started out from a station, a short distance east, and the leading train, having been unable to use the switch at Rock, was moving backward toward the eastern end of a long siding, about 1½ miles; and was making this movement without flag protection. The conductor stated that he had instructed Flagman Nichols (who was killed) to remain at King to hold all westbound trains, but Nichols did not remain there and continued on the train. The presence of this brakeman on the train appears to have been known to the conductor, and the inspector does not credit his testimony. Moreover, there was testimony that the conductor had said in reply to questions about his procedure that in setting back from Rock he would take a chance. The conductor had ignored Rule 97b which says that "conductors must deliver to their engineers a copy of all flagging instructions given their flagman, and will require the engineer to acknowledge receipt by endorsing a copy to be retained by the conductor. Upon this copy the conductor will also take a receipt of the flagman." The engineman, therefore, is held in part responsible, for not requiring a written notice. Extra 460 was also at fault in running faster than eight miles an hour, which limit had been placed in the train order on which the engineman was running.

Pennsylvania, Ellendale, Del., October 10, 7:12 p. m. A northbound freight train, moving at about 10 miles an hour, ran off the track at an open derail, approaching a crossing, and the locomotive and first car were overturned. The engineman was killed. This derailment was due to disregard of a semaphore signal, the light of which was not burning. The engineman evidently acted on the clear indication of a manual block signal at Ellendale station, about 600 ft. farther north. The marker light of the crossing signal was burning, but faintly. The approach to this crossing is marked by a slow board about 3,000 ft. south of the home signal, and the rule requires that after passing the slow board all trains must be prepared to stop at the home signal. Obedience to this rule probably would have averted the derailment and saved the engineman's life. Running at lower speed, he would have noticed the absence of the light on the crossing signal. Discussing the possible confusing indication of the two signals, it was found that there had been a derailment at this point in April, 1922, and also one in December, 1924. It appears, however, that, if speed is properly controlled in accordance with the rule, the distance between the signals and the fact that the lights of the first one are 4 ft. higher than the corresponding lights on the other, would enable an engineman readily to distinguish between the two signals.

Atlantic Coast Line, Mango, Florida, October 10, 10:13 p. m.—Southbound passenger train No. 89, having waited at Seffner for the first section of northbound No. 82, proceeded southward and after running about two miles collided with the second section of No. 82. Both trains were running at good speed. The engineman of the northbound train was killed and 16 passengers, three mail clerks, 10 employees and two Pullman porters were

injured. The collision was due to misreading of a train order. By order No. 137, first No. 82 was to meet No. 89 at Uceta, a point farther south; by order No. 139 the meeting point was changed to Seffner. The engineman of the southbound train, however, in reading order No. 137 held the paper in his hand with his thumb covering "first" and therefore, assumed that the order required him to meet both sections at Uceta; and, then, order No. 139 was taken to make a change of the earlier order only as regards the first section. The conductor appears to have depended upon the engineman's reading of the order, without himself giving careful attention. Both conductor and engineman are also blamed for not showing their orders to their subordinates. The report says that these men were experienced, but gives no information about their past records.

Pennsylvania, Seward, Pa., October 14, 4:45 a. m.—Eastbound freight extra 3721, moving at about 10 miles an hour, ran into the rear of a preceding freight, and the caboose and several cars were destroyed. The conductor of the leading train, which was at a standstill, was killed, in the caboose; and two other employees were injured. There was a dense fog at the time and the cause of the collision was the failure of the engineman properly to observe and obey automatic block signal indications. The engineman declared that he had received clear indications, and his engine struck the other train while still working steam. The inspector seems convinced that the engineman passed the signals without noting their indications or else that he saw the indications and failed to obey. The flagman of the standing train said that he had put down torpedoes, but when he saw 3721 approaching, he took them up, assuming that the engineman was fully aware of the location of the train ahead; the inspector, however, blames the flagman for not leaving the torpedies on the rail, as required by rule. Also, there was doubt as to whether the flagman went far enough back, but as the engineman admits that he did not see either the flagman or the standing caboose, it does not appear that the distance traversed by the flagman was a factor in the case. It appears from the report that, only a short distance back, the engine of extra 3721 had been detached to push the leading train for some little distance, the engine of the leading train having failed because of lack of steam.

Pennsylvania, Warwood, W. Va., October 14.—Passenger train No. 531, from Pittsburgh to Wheeling, was derailed at a facing point switch while moving at about 50 miles an hour, and the locomotive was overturned. The engineman, fireman and a road foreman of engines were killed, and five passengers and two employees were injured. The switch had been partly opened by the hanger of a drop door of a coal car, which had passed over the road a short time before. The switch rod was considerably bent but not enough to change the indication of the switch target. The hopper doors were found to be open on another car, in the same freight train, and the report suggests the need of better inspection and maintenance of the door closing mechanism on these cars. It seems that the winding mechanism failed to hold the hangers in a vertical position, by reason of a key bolt having been lost out. It appears probable that the hopper door had been jarred loose when after doing some switching, the head portion of the train had been backed against the rear portion.

Houston & Texas Central, Alma, Tex., October 15.—Westbound extra freight train 809 which had been stopped, about two miles west of Alma, for the correction of some slight difficulty, was run into at the rear by extra freight 780, which was moving at from 30 to 40 miles an hour, making a bad wreck. A brakeman of

780 was killed and two other employees were injured. There was a dense fog at the time and engineman Johns of extra 780 is held at fault for not maintaining a proper look-out and for not taking prompt measures to stop after having been warned of danger ahead; and the conductor and flagman of extra 809 are blamed for not using fuses. This latter point is based on the fact that 809 was running at about 20 miles an hour whereas the allowable speed for freight trains is 35 miles an hour; and 780 was running at that rate or faster. Engineman Johns committed suicide at some time subsequent to the collision, and the inspector made extensive inquiries as to what his mental condition had been, as observed by his fellow employees and by his superiors; but nothing definite was developed. Some of his comrades thought him a little queer but that is about all that could be learned. The flagman of 809, who went back, was unable to see any person in the cab of the locomotive and other witnesses testified that the engine appeared to be running without an engineer; and steam had not been shut off when the collision occurred. Engineman Johns was 43 years of age and entered the service as machinist's helper in 1902.

Georgia Southern & Florida, Clinchfield, Ga., October 18.—A southbound extra freight which had been stopped because of the rupture of a coupling was run into at the rear by a following second class freight, moving at from 20 to 40 miles an hour, making a bad wreck. The engineman and one brakeman of the colliding train were killed and three employees were injured. The standing train had not been properly protected by flag. Both of these trains had been side-tracked (at different stations) to meet a northbound passenger train and, after resuming their journeys, the time interval between them was shortened because the leading train had to back out of the side track while the other one did not; and it is believed that the two trains were not more than three or four minutes apart when leaving Kathleen, six miles north of Clinchfield. No block signal system is in use. The inspector finds that there was no serious delay on the part of the flagman in going back, but there was a dense fog. The flagman, however, was criticized for not throwing off a fusee when the train was backed out of the siding at Kathleen. The report points out the uselessness of a time interval rule, in a situation like that which developed in this case. Both trains had been much delayed by having to keep out of the way of several passenger trains, northbound and southbound. The average number of trains operated daily in this line has increased within the past 12 months from 28 to 44 and, says the inspector, "It is believed that traffic of this density warrants the introduction of additional means of safeguarding train operations."

Lehigh Valley, Oakwood, N. Y., October 31, 6:27 p. m.—Westbound passenger train No. 303, moving at about 25 miles an hour, ran over a misplaced switch and was derailed on a sharp curve, the locomotive being overturned. The fireman was killed and three passengers and one employee were injured. The switch had been left misplaced by the crew of a freight train which had been doing some work on the siding; the conductor had left the care of the switches to his brakemen, and both brakemen admitted having gone off without thinking of this switch. The engineman explained in part his failure to see the switch light by the fact that he was approaching a platform which was a flag stop and was looking ahead, in the darkness, to see if passengers were waiting.

Atlantic Coast Line, Rochelle, Fla., November 5.—Collision between two locomotives of a train, one of which had been sent forward and was returning, re-

sulting in the death of the engineman of the leading engine and the injury of two other employees. The train was a southbound extra freight. Being delayed by the parting of a coupling, the train began to encroach on the time of northbound passenger train No. 10, and the leading engine was cut off and sent to Rochelle with instruction to flag No. 10 and to stay there; but this instruction was not carried out and, about twenty minutes later, when the second engine went on with a part of the freight train it collided with the leading engine, which was returning; speed 25 or 30 miles an hour. The collision did much damage to several cars and to the second locomotive; and also to the tender of the leading locomotive, but the locomotive itself, having been reversed ran southward about three miles, stopping when the steam became exhausted. The blame is placed on the runner of the leading engine who disobeyed the instruction to remain at Rochelle until the balance of the train arrived. The engineman having been killed, instantly, the reason for his failure could not be determined. The colored fireman made a faint attempt to remind the engineman of the conductor's instructions, when they started to return; he "felt that the engineman understood the meaning, and therefore said no more about it." The conductor is held to be open to criticism because he did not send a brakeman to flag No. 10. His excuse is that one of his brakemen was inexperienced and he could not spare the other one. This conductor had served as brakeman five years, and as conductor five months.

Pennsylvania, Monmouth Junction, N. J., November 12, 1925.—A rear-end collision of two passenger trains which resulted in the death of nine passengers and one Pullman porter, and the injury of 20 passengers, 11 mail clerks and four employees. The accident was caused by failure of an engineman to observe and obey signal indications and a contributing cause was failure of a flagman to place torpedoes. The I.C.C. report on this accident was abstracted in the *Railway Age* of February 6, 1926, page 404.

Chicago, Milwaukee & St. Paul, Sacred Heart, Minn., November 15, 1:35 a. m.—Westbound passenger train No. 17, collided with eastbound freight No. 264, the freight being wrongfully on the time of the passenger; four persons killed, 21 injured. This collision was reported in the *Railway Age* of March 13, page 816.

West Maryland, Mount Savage, Md., November 15, 10 p. m.—An eastbound freight train consisting of a locomotive, 70 cars loaded with coal, and a caboose, became uncontrollable on a steep descending grade (1¾ per cent) and was wrecked, one employee being injured. The train broke in two between the 63rd and 64th cars when one mile east of Colmar, and stopped with the two parts separated by a space of about 300 ft. After waiting some time expecting help from a following locomotive, the seven rear cars were moved by gravity down the grade and struck the standing cars at about four miles an hour; the cars did not couple; but the impact caused the forward portion of the train to start and it immediately got beyond control. After running about six miles the 15 rear cars left the rails; a mile further along 21 cars were derailed, and a short distance further about half of the remaining cars ran off at a curve of 7 deg.; and a little further along the remaining 14 cars and the locomotive were derailed. The distance from the first derailment to the last was 8900 ft. The engine was badly damaged and most of the cars were demolished. The conclusion of the report is that the cars ran away and were wrecked because not enough hand brakes had been set on the leading portion

of the train while it was standing. Nothing was developed to show definitely why the engineman failed in his attempts to build up the brake-pipe pressure, but it is believed that it was due to an open brake-pipe on some portion of the standing train. For a period of nearly one hour there was not enough pressure properly to control the train and, therefore, the engineman is held at fault for not having called for the application of hand brakes. The testimony of the conductor, the head brakeman and a railroad police officer on the train was somewhat confusing in relation to their handling of the angle cocks and to the variations in air pressure. The inspector thinks that the conductor moved the rear portion of the train against the forward portion without knowing whether or not there was sufficient air pressure.

Pennsylvania, Altoona, Pa., November 29.—An east-bound freight train moving at uncontrollable speed, on a steep descending grade was derailed and wrecked; engineman and fireman killed, one trainman injured. The men in charge of the train were held blameworthy for having neglected to make sure of efficient brake power after the train had been stopped on the grade by some unknown cause. This derailment was reported in the *Railway Age* of March 20, page 856.

Atlantic Coast Line, Trilby, Fla., December 1, 12:40 a. m.—Collision between two engines, one at a standstill and the other moving slowly backward. Slight damage was done, but a boy acting as helper for the hostler who was in charge of the moving engine was killed. The hostler is held responsible, for operating an engine within yard limits not prepared to stop. The boy, who was on the ground, had given a motion signal to stop which the hostler should have seen, but did not. The investigation developed the existence of a practice of employing men in various capacities "without properly instructing them concerning the rules under which they are working and without furnishing them either with a copy of the book of operating rules or with a time-table. The proper officials should take immediate action to remedy such conditions; it is only fair to state, however, that the present superintendent had only been in charge for a few days prior to the date of the accident."

Missouri Pacific, Milo, Mo., December 12.—East-bound passenger train No. 218, moving at about 30 miles an hour, was derailed, probably by uneven track, and the locomotive and one car were overturned. The engineman and the fireman were killed and six passengers were injured. The locomotive was of the 2-8-2 type, generally used in freight service, and the speed limit for such engines with passenger train is 35 miles an hour. The conclusion of the report says that the cause was not definitely ascertained; but the track was irregular and in one place (on tangent) the right rail was $1\frac{3}{4}$ in. lower than the left rail. The track foreman said that he had trouble in obtaining proper drainage at this point; and he had only one man to assist him in maintaining $5\frac{3}{4}$ miles of main track and of $2\frac{3}{4}$ miles of side track.

Atlantic Coast Line, Maitland, Fla., December 16.—Southbound passenger train, No. 89, consisting of a locomotive and 12 cars, traveling at about 35 miles an hour, was derailed on a curve of six degrees, by a loose rail on the high side of the curve, making a bad wreck. The locomotive was overturned and the fireman was killed. Ten other persons were injured. The rails had not been properly spiked on the inside, many headless spikes being found.

Pennsylvania, Gallitzin, Pa., December 19.—Derailment of a passenger train which resulted in the death

of one passenger and the injury of 33 passengers and four employees. The accident was caused by excessive speed on a curve and on a 1.71 per cent descending grade. The location is known as Bennington curve and speed of trains at this point is restricted to 30 miles an hour, but it was estimated that the speed at which the train was running was 60 miles an hour before the engineman made application of the brakes. There was evidence that prior to reaching this point there had been trouble with the air brakes, causing undesired emergency applications. The engineman had expected when he applied the brakes for the purpose of retarding his train on the curve to have another emergency application, and he had apparently planned to stop and then proceed around the curve slowly, but when the brakes were applied the train was already going too fast to permit its being brought under control. The I.C.C. report on this accident was noticed in the *Railway Age* of April 17, 1926, page 1090.

Atlantic Coast Line, Moncks Corner, S. C., December 24, 6:42 a. m.—Collision between southbound passenger train No. 85, first section, running at about 15 miles an hour, and northbound passenger No. 76, moving at about 50 miles an hour, making a bad wreck; both enginemen and both firemen killed and 35 passengers and 19 employees injured. Both trains were long and heavy expresses, and both were moving on the southbound track because of an obstruction on the northbound. No. 76 had right of track and No. 58 ran past Moncks Corner (about two miles) without receiving a train order which should have held it there. There are automatic block signals for the guidance of southbound trains on this track, located about one mile apart, but whether or not one of these signals should have given warning to the southbound train is not considered. This train ran past the train-order signal at Moncks Corner at full speed; but the inspector excuses the engineman because this is normally a day office and because also the light may have been dim; and the primary responsibility is placed on the dispatcher for his failure to notify all concerned that the station at Moncks Corners was being operated as an open office (this, because of the disarrangement of train movements due to the obstruction on the northbound track). The dispatcher is also blamed for not placing the order for the southbound train at a station farther north, and for not instructing the agent at Moncks Corner to take special precautions when he held an order for a train, which required that train to stop at his station. Train-order signal lights are not required to be kept burning when an office is closed and, therefore "it is entirely probable that the engineman of first No. 85 did not even look at the signal." The agent at Moncks Corner had been called at 4 a. m. because of the emergency. He had been agent here only two months although he had been employed as a clerk for several years. Train orders were transmitted by telephone.

New York Central, Wallacetown, Pa., December 26, 8:35 a. m.—A westbound freight train of one locomotive and 90 cars which had been nearly or quite stopped (to permit the engineman to go to a telephone booth for instructions) was run into at the rear by locomotive No. 3800 which had pushed this freight from Avis, about 72 miles back, and had been detached at the summit about one mile back; and one brakeman was killed. The inspector places the responsibility on the engineman of 3800 who should have been running under control, knowing, as he did, that he was closely following the freight; on the conductor and the flagman of the freight for not properly protecting their train, and on the railroad company because it did not

provide safe methods for the movement of helper engines. It appears that the manual block system is maintained for passenger trains, and on certain steep grades for freight trains, but light engines are permitted to follow freight trains without regard to either time-interval or space-interval rules. From Munson 8 miles east of Wallaceton to Woodland, 5 miles west of Wallaceton, the line is operated as permissive block for freight trains; but the trains must not proceed beyond Bigler (3 miles east of Woodland) until notified that the block beyond Woodland is clear, this last named block being on a steep descending grade where an absolute block is maintained. The inspector believes that if the conductor and flagman of the freight had been efficiently on the alert, they could have thrown off a fusee in time to prevent the collision. Helper engines moving down this grade are run in response to instructions by telephone, not written, and no space interval or time interval is required, although the line is crooked and the grade for much of the way as steep as one per cent or greater. It is suggested that a spur should be put in near the summit to be used by helper engines to make way for trains following them.

Fully Enclosed Diesel Engine

PARALLELING the development work that is being carried on in the design and construction of large Diesel engines for passenger and freight locomotives, the Foos Gas Engine Company, Springfield, Ohio, is now building industrial Diesel engines with from two to eight cylinders, a power range of from 45 to 475 hp. and an operating speed range of from 400 to 900 r.p.m. The smaller units are designed primarily for cranes and shovels and the larger for rail cars and small locomotives.

It is anticipated by the builders that the application of these Diesel units to rail cars and small locomotives will materially reduce the operating cost per mile as compared with gasoline engine operating cost. The new Diesel engine, with its inherent fuel economy, and increased dependability over gasoline engines, on account of more substantial engine construction, slower speed, and more favorable operating characteristics, will, it is anticipated, make possible a further reduction in fuel mileage cost.

An exterior inspection of this unit does not identify it as a Diesel engine as it is entirely enclosed and no moving part is visible. This has been done to provide a power unit for cranes and shovels. To operate successfully in such equipment any engine should be completely protected from dust and dirt and any foreign matter that might get into the bearings and other working parts. The complete enclosure of the engine also saves it from the danger of having tools or other heavy objects fall into the working parts and confines the lubricating oil that is circulated through the engine. The new unit is designed so that the lubricant can not leak from any part.

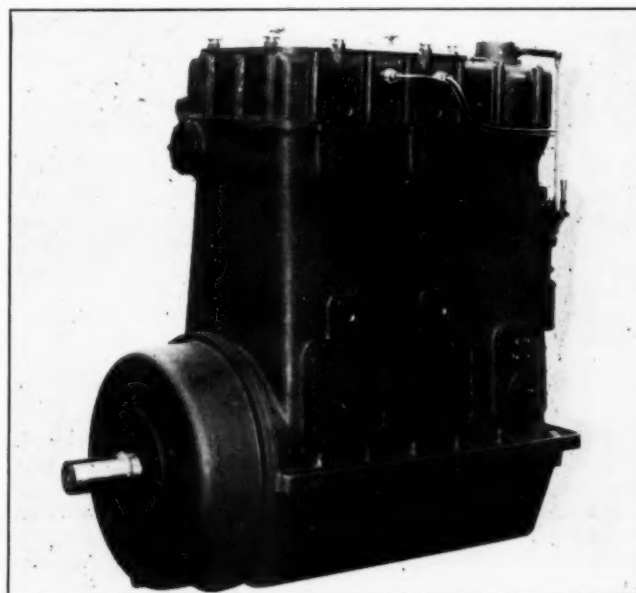
While completely enclosed, the new engine is not inaccessible. Large cover plates are provided on both sides, opposite the crank throws, which give access to the lower part of the main cylinder frame. The top of the engine is provided with cover plates that may be lifted up for inspection of the heads, the valves and the valve mechanism.

The Foos industrial Diesel is a four-cycle engine and operates on the full-Diesel combustion cycle. A cross section of the engine indicates a plain Diesel combustion chamber; in other words, the head and piston

top are flat, there being no recesses or precombustion cups of any type. Fuel for combustion is injected into the combustion chamber vertically at the axis of the cylinder. Atomization of the fuel is secured by the mechanical injection principle.

The designers have given considerable attention to the matter of valves and valve gear. Four valves are provided in each head, two for the exhaust and two for the inlet. At the height of the head of the main box frame, which houses the entire unit, a recess in the casting provides the air inlet manifold, and the air inlet valves are located in the head adjacent to the front side of the engine. A passage through the main box frame at the back of the engine is provided for the exhaust gases to enter an exhaust header. For valve operation a cam-shaft runs the full length of the engine at the height of the cylinder heads. The cam-shaft drive involves the use of a silent chain driven directly from the crank shaft.

The moving power plant, as the prime mover of the



The Foos Type L 66 hp. Diesel engine

rail car may be considered, must be simple and accessible. This unit is arranged so that any of the valves or the valve levers may be removed without disturbing any other portion of the mechanism. Throughout the engine, means have been provided that any minor adjustment may be made without difficulty, and without the removal of any heavy engine parts.

The flywheel of the engine is enclosed, operating in a bell housing. All of the fuel pumps and the governor are completely housed, giving them the same protection as is offered the other main working parts of the engine.

A central lubricating oil system furnishes oil to every bearing in the engine under pressure. In the lower part of the bed plates a trough is provided where the lubricating oil is collected. An oil pump picks up the lubricant, puts it under pressure and distributes it to all the bearings of the engine. No oil or grease cups are used.

The Foos Industrial-Diesel has an operating speed from 400 to 900 r.p.m. Tests that have been made at the factory indicate complete combustion is secured throughout this entire range using low grades of fuel oil. The design of the sprays and the fuel system as a whole is such as permits the use of oils having a low gravity.

General News Department

The Union Pacific henceforth will hire no women as regular employees, except as stenographers or comptometer operators. Women now employed will not be affected by the order but will retain their positions.

The Interstate Commerce Commission has modified its automatic train control order as it applies to the Chicago, Indianapolis & Louisville to provide for the installation to be made on that portion of the line between Monon, Ind., and Indianapolis.

A "college of cookery" is to be established by the Pennsylvania at Columbus, Ohio, for the purpose of training stewards, cooks and waiters for the road's dining cars. It is proposed also to establish similar schools at New York and Chicago. Not only will new men be trained but employees now in service will occasionally be given short courses, to refresh their training and thus maintain uniformly high standards.

Full ownership of the Edmonton, Dunvegan & British Columbia and the Central Canada now rests with the government of the province of Alberta, as a result of its payment of \$1,275,000 to the Royal Bank in final settlement of its claim of \$2,400,000 and accrued interest. The provincial government will proceed to deal with other interests for the future operation of these lines or may operate them as a public enterprise.

R. F. P. A. Annual Meeting

R. R. Hackett, Baltimore, Md., secretary of the Railway Fire Protection Association, announces that the annual meeting of the association will be held at New Orleans, La., on Tuesday, Wednesday and Thursday, October 12, 13 and 14. Details will be announced in the next News Letter of the association. One whole day is to be set aside for open discussion of field practice.

Telegraph and Telephone Section Annual Meeting

The Telegraph and Telephone Section of the American Railway Association, H. A. Shephard, chairman; W. A. Fairbanks, secretary, announces the annual meeting of the Section, which is to be held at the New Ocean House, Swampscott, Mass., on Tuesday, Wednesday and Thursday, September 21, 22 and 23. Besides the regular reports of each of the standing committees, 18 of them, there will be papers by D. W. Whitney (A. T. & T. Company), on Loading for Telephone Cable Circuits, and by J. O. Carr (Morkrum-Kleinschmidt Corporation) on the Use of Printing Telegraphs in Railroad Operation. Copies of reports and papers will be forwarded to members at an early date.

Chicago Electrification Plans

The special committee of the Chicago City Council, investigating the possibility of electrification of railway terminals, at a hearing on August 10, listened to George A. Harwood, vice-president of the New York Central. Mr. Harwood cited figures showing the increase of capacity of railways by electrification and also the increase in property values as evidenced at the Grand Central Terminal, New York City. As yet, however, the rents derived by the New York Central from the development of its air rights in New York have not been sufficient to pay the interest on the whole investment. Mr. Harwood would not expect the development of a high class apartment district in Chicago, as there has been no tendency on the part of the people to develop the territory south of Van Buren street. Any electrification plan in Chicago should provide for the interchange of power among the railways, and there should be no duplication of electric installation. Such an elaborate and compre-

hensive enterprise necessarily makes slow progress; the work in New York City was started in 1903 and will not be entirely completed even in 1928.

Ford's Railroad Wants

Retroactive Extension of Time

The Detroit & Ironton, owned by Henry Ford and members of his family, has applied to the Interstate Commerce Commission for a modification of the order issued by the commission in 1921 authorizing the construction of a line from Springwells, Mich., to Flat Rock, to extend the time for the completion of the road to December 31, 1923. The order provided that the line was to be completed by 1922 but it was delayed and not put into operation until December, 1923. Due to reorganization of the company's legal department, the application says, formal extension of the time for completion was not requested or procured.

Continuous Train Control Demonstration

on the Michigan Central

On July 13, a demonstration of the continuous type of automatic train control (Clark patents) as manufactured by the Continuous Train Control Corporation, New York, was made on the Michigan Central near Rives Junction, Mich. This test, on a 4,000 ft. track section, with one locomotive, is said to have demonstrated the practicability of the principle of the system, which includes a so-called radio feature. An oscillator delivers a high frequency energy to the rails when the signal is at clear and a different frequency when the signal is at caution; while no energy is delivered when the signal is at stop. The current is picked up by receiver coils on the engine, in a manner somewhat similar to other continuous systems.

Mediation Board Begins to Function

The new United States Board of Mediation, recently appointed by the President under the provisions of the Watson-Parker Railway Labor Act, began to function at a meeting in New York this week beginning on August 9 when committees, representing the eastern railroads and the Brotherhood of Railroad Trainmen and the Order of Railway Conductors, were heard. Demands for increased wages by the two unions were refused by the roads some time ago. Both parties asked the board to exercise its offices in an attempt to settle the dispute, and, the New York conference is the first step taken toward this end. If the board is unable to bring about an amicable adjustment between the parties, it is required, under the terms of the law, to make an effort to induce them to consent to arbitration.

Master Blacksmiths to Meet in Cleveland August 17

The International Railroad Master Blacksmiths' Association will hold its thirtieth annual convention August 17, 18 and 19 at the Hotel Winton, Cleveland, O. There will be an exhibit held in conjunction with the convention under the auspices of the International Railroad Master Blacksmiths Supply Men's Association, of which James A. Murray, Ajax Manufacturing Company, is president. The program consists of committee reports on a total of ten subjects which are as follows: Auto-genous Welding, A. W. Young (N. Y., N. H. & H.), chairman; Carbon and High Speed Steel, Frank P. Diessler (B. & L. E.), chairman; Drop and Machine Forging, C. C. Ferguson (N. P.), chairman; Drawbars and Drawbar Pins, C. D. Hayes (N. P.), chairman; Frame Making and Repairing, John P. Reid (M. P.), chairman; Heat Treatment of Steel and Iron, T. F. Buckley (D. L. & W.), chairman; Reclamation, H. Wright (P. M.), chairman; Spring Making and Repairing, J. B. Ray

(M. P.), chairman; Safety First, J. J. Haggerty (N. Y. C.), chairman; and Tools and Formers, C. A. Wagner (N. Y. C.), chairman.

First Six Months Near Record on C. P. R.

The first six months of 1926 was the second greatest half-year in the history of the Canadian Pacific as regards gross, being more than \$10,000,000 ahead of the first six months of 1925, and less than \$6,000,000 below the record figures for 1920.

The increase in net for the month of June was only slightly below the big increase recorded in May, being the second greatest increase since last September. Both gross and net were the largest for the year to date. It was the second greatest June gross in the history of the company, the gross of June, 1920, having topped it by less than a million dollars. The net showing was the best for any June since 1919.

The following tables show the gross earnings, operating expenses and net for June and for the six months, with comparison:

June	1926	1925	Inc.
Gross	\$15,533,968	\$13,464,647	\$2,069,321
Oper. exp.	12,706,864	11,880,196	826,668
Net	\$2,827,103	\$1,584,450	\$1,242,652
Six Months:			
Gross	\$85,227,786	\$75,155,819	\$10,071,966
Oper. exp.	71,271,099	67,358,173	3,912,925
Net	\$13,956,687	\$7,797,646	\$6,159,041

Wage Statistics for May

The Class I railroads reported to the Interstate Commerce Commission a total of 1,808,728 employees as of the middle of May, 1926, an increase of 25,317, or 1.4 per cent over the number for the previous month. The total compensation, \$246,537,234, shows an increase of \$3,593,864, or 1.5 per cent.

Compared with the returns for the corresponding month last year, the number of employees reported in May, 1926, shows an increase of 2.3 per cent and the compensation shows an increase of 3.7 per cent. The difference between the increase in compensation and in employment is due largely to an increase in the average number of hours worked per employee.

The number of employees at the middle of the month was as follows:

Group	May, 1926	Increase over	
		April, 1926	May, 1925
Executives, officials and staff assistants..	16,806	10	355
Professional, clerical and general.....	284,083	452	2,908
Maintenance of way and structures....	436,542	32,684	26,755
Maintenance of equipment and stores..	516,302	(d) 6,311	(d) 2,584
Transportation (other than train, engine and yard)	207,414	106	1,219
Transportation (yardmaster, switch tenders and hostlers).....	24,014	(d) 31	205
Transportation (train and engine service)	323,567	(d) 1,593	12,578
Total	1,808,728	25,317	41,436

(d) Decrease.

Trainmasters and Others Exhorted by Safety Section

Thomas H. Carrow, chairman of the Committee of Direction of the Safety Section, A. R. A., following up the resolution which was adopted at the last annual meeting of the Section, calling for increased activity on the part of the immediate supervisors of those classes of employees which figure most frequently in the accident records, has addressed to division engineers, trainmasters, road foremen of locomotives and master mechanics, a letter, pointing out special lessons to be derived from the I. C. C. accident record for the first three months of this year. This record is set forth in condensed form and supplemented by comparisons with the record for the same quarter of 1925.

The proportions of persons killed and injured per million hours on duty and per million locomotive miles, are shown in general to have been somewhat more favorable than last year, but the circular brings out numerous points calling for additional effort. Train accidents show an increase; whereas, says Mr. Carrow, it was reasonable to have expected a better showing, and "the record is especially called to the attention of trainmasters and road foremen." "Coupling and Uncoupling" and "Getting on and off Cars" are classes which still show increases; "can't something be done to impress upon employees the hazards of these opera-

tions?" Non-train accidents show a diminution of 12 per cent, "thanks to master mechanics, division engineers and other supervisory forces."

Twelve passengers were killed and 276 injured getting on and off trains. Train crews are reminded that they can help to prevent these accidents.

Tool Foremen to Meet in Chicago

The fourteenth annual convention of the American Railway Tool Foremen's Association will be held at the Hotel Sherman, Chicago, September 1-3. The program arranged for this meeting is as follows:

WEDNESDAY, SEPTEMBER 1

Address by L. A. Richardson, general superintendent of motive power, Chicago, Rock Island & Pacific.
Address by President E. A. Hildebrandt.
Report of secretary-treasurer.
Appointment of committees.
Unfinished business.
New business.
Report of Standing Committee on New Labor-Saving Tools and Devices for the Air Brake Department, H. Otto, chairman.
Report of Standing Committee on Training of Men Suitable for Tool-room Work, J. J. Sheehan, chairman.

THURSDAY, SEPTEMBER 2

Address, "Simplification, a New Tool for the Tool Foreman," by Edwin W. Elv, assistant director, Department of Commerce.
Report of Standing Committee on Standardization of Present Special Boiler Taps, O. D. Kinsey, chairman.
Report of Standing Committee on New Tools and Safety Devices for the Car Department, G. Reichart, chairman.
Election of officers.
Special visit to exhibits.

FRIDAY, SEPTEMBER 3

Report of Standing Committee on General Locomotive Shop Kinks and Devices, J. E. Carroll, chairman.
Report of Standardization Committee, E. J. McKernan, chairman.
Report of Committee on Auditing, Committee on Thanks, and other special committees.
Selection of place for annual convention.
Adjournment.

Program for General Foremen's Convention

The following program has been arranged for the annual convention of the International Railway General Foremen's Association, which will be held at the Hotel Sherman, Chicago, September 7 to 10, inclusive. The program is divided into morning and afternoon sessions, with the exception of Friday.

TUESDAY, SEPTEMBER 7

Address of welcome by Mayor Dever.
Response by Pres. H. E. Warner.
Address, "The possibilities of the General Foremen's Association," by E. L. Woodward, associate editor, *Railway Age*.
Response, J. N. Chapman.
President Warner's address.
Report of secretary-treasurer.
Appointment of committees.
Topic No. 1—Balancing shop sub-departments.
Locomotive department, F. F. McCarthy, chairman.
Car department, A. H. Keys, chairman.
Discussion.

WEDNESDAY, SEPTEMBER 8

Address by L. C. Dickert, superintendent motive power, Central of Georgia.
Response, A. H. Keys.
Response, T. C. Gray, supervisor of apprentices, Missouri-Kansas-Texas.
Topic No. 2—Development of the mechanic, R. J. Farrington, chairman.
Discussion.
Topic No. 3—Maintenance of refrigerator car, J. N. Chapman, chairman.
Discussion.
Election of officers.

THURSDAY, SEPTEMBER 9

Address by D. C. Curtis, chief purchasing officer, Chicago, Milwaukee & St. Paul.
Response, F. M. A'Hearn.
Topic No. 4—The general foremen's responsibility for material surplus or shortage, F. M. A'Hearn, chairman.
Discussion.
Address by F. H. Becherer, assistant to mechanical superintendent, Boston & Maine.
Response, W. F. Lauer.
Topic No. 5—Developing railroad shop foreman, J. R. Leveridge, chairman.
Discussion.

FRIDAY, SEPTEMBER 10

Address by M. A. Hall, superintendent machinery, Kansas City Southern.
Response, F. R. Harmon.
Topic No. 6—Modern shop equipment as a factor in increased production, H. W. Harter, chairman.
Discussion.
Reports of committees.
Unfinished business.
New business.
Adjournment.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1926

Name of road	Average mileage operated during period	Operating revenues				Operating expenses				Operating ratio	Net from railway operation	Operating income (or loss)	Net after rents	Net after rents, 1925
		Freight	Passenger	Total	(inc. misc.)	Way and structures	Maintenance of equip-	Traffic	Portation	General	Total			
Akron, Canton & Youngstown.....	June 171	\$240,244	\$342	\$251,212	\$29,026	\$10,449	\$29,026	\$11,809	\$72,267	\$14,725	\$178,276	\$14,725	\$19,582	\$72,926
Albany & Schenectady.....	June 171	1,498,388	3,326	1,501,714	178,700	296,700	178,700	68,363	460,113	90,022	1,093,693	90,022	169,121	313,184
Alabama & Vicksburg.....	June 118	1,052,030	256,197	1,408,227	288,378	613	288,378	50,992	487,067	77,770	1,192,577	77,770	148,686	333,233
Vicksburg, Shreveport & Pacific.....	June 6	8,026	367	8,393	1,045	409,104	1,045	616	11,202	540	19,749	540	37,167	43,293
Ann Arbor.....	June 293	423,735	124,989	548,724	105,395	63,327	105,395	12,227	178,452	33,203	372,034	33,203	74,986	216,643
Ann Arbor.....	June 293	2,632,700	146,686	2,779,386	606,669	263,610	606,669	70,008	1,201,987	82,000	2,224,588	82,000	419,902	471,100
Atchison, Topeka & Santa Fe.....	June 9,220	11,453,087	3,783,201	15,236,288	3,096,085	348,599	3,096,085	4,917,890	4,917,890	349,021	11,526,147	349,021	3,503,655	2,939,220
Gulf, Colorado & Santa Fe.....	June 1,908	63,535,892	19,693,509	83,229,401	18,600,080	21,430,300	18,600,080	28,655,448	28,655,448	2,237,637	60,152,033	2,237,637	16,866,650	13,836,439
Gulf, Colorado & Santa Fe.....	June 1,908	1,321,362	232,115	1,553,477	232,115	1,119,362	232,115	40,149	478,407	1,184,733	1,834,142	1,184,733	166,859	118,734
Gulf, Colorado & Santa Fe.....	June 1,908	10,473,472	1,396,847	12,870,319	2,792,334	2,897,870	2,792,334	307,659	4,468,346	383,648	10,853,176	383,648	523,471	944,767
Panhandle & Santa Fe.....	June 923	897,645	147,756	1,045,401	158,642	158,642	158,642	9,272	348,662	19,716	782,999	19,716	189,355	64,957
Panhandle & Santa Fe.....	June 923	4,872,300	770,886	5,643,186	611,844	611,844	611,844	58,943	1,996,809	113,708	3,702,418	113,708	1,967,555	1,734,863
Atlanta & West Point.....	June 93	1,565,544	69,153	1,634,697	221,118	221,118	221,118	67,111	564,373	69,420	1,242,378	69,420	172,922	179,327
Atlanta & West Point.....	June 93	974,567	411,213	1,385,780	289,832	289,832	289,832	47,111	564,373	69,420	1,242,378	69,420	172,922	179,327
Western of Alabama.....	June 133	1,760,074	61,884	1,821,958	35,964	35,964	35,964	12,816	84,319	13,353	211,902	13,353	32,536	55,338
Atlanta, Birmingham & Atlantic.....	June 639	1,200,059	386,537	1,586,596	201,519	201,519	201,519	71,122	534,888	76,364	1,248,005	76,364	381,821	334,204
Atlanta, Birmingham & Atlantic.....	June 639	335,306	40,993	376,299	85,800	85,800	85,800	25,951	168,936	19,779	413,804	19,779	18,927	35,323
Atlanta, Birmingham & Atlantic.....	June 639	2,259,228	241,667	2,500,895	614,354	614,354	614,354	166,287	1,065,728	113,232	2,565,696	113,232	73,003	24,157
Atlantic Coast Line.....	June 4,930	5,423,444	1,477,692	6,901,136	1,106,472	1,106,472	1,106,472	138,617	2,685,046	175,742	5,663,449	175,742	1,071,993	1,052,328
Charleston & Western Carolina.....	June 342	36,501,738	12,849,927	49,351,665	9,025,120	9,025,120	9,025,120	927,965	18,287,217	1,026,354	35,886,247	1,026,354	11,966,787	11,774,320
Charleston & Western Carolina.....	June 342	2,031,722	22,000	2,053,722	57,525	57,525	57,525	43,751	782,758	39,815	1,516,193	39,815	67,196	63,060
Baltimore & Ohio.....	June 5,294	17,183,105	2,649,322	19,832,427	4,171,367	4,171,367	4,171,367	399,509	6,805,409	536,514	14,742,236	536,514	2,871,153	3,338,604
Baltimore & Ohio.....	June 5,294	96,702,181	13,368,187	110,070,368	14,127,551	27,056,201	14,127,551	2,363,039	41,941,620	3,205,284	89,736,845	3,205,284	20,811,533	18,714,112
Baltimore & Ohio.....	June 80	.....	.....	330,802	33,313	29,300	33,313	1,886	15,112	1,497	21,400	1,497	13,700	10,624
Baltimore & Ohio.....	June 80	.....	.....	1,808,879	207,776	271,589	207,776	43,751	782,758	39,815	1,516,193	39,815	67,196	63,060
Staten Island Rapid Transit.....	June 23	102,445	135,020	237,465	51,172	51,172	51,172	2,051	17,179	15,120	220,132	15,120	3,466	14,935
Bangor & Aroostook.....	June 615	388,290	45,437	433,727	86,257	86,257	86,257	11,502	115,002	21,366	326,929	21,366	108,368	54,216
Belt Ry. Co. of Chicago.....	June 32	.....	.....	616,841	98,110	98,110	98,110	3,168	267,822	8,534	437,182	8,534	131,027	125,775
Belt Ry. Co. of Chicago.....	June 32	.....	.....	3,598,567	338,239	338,239	338,239	19,547	1,726,331	55,072	2,511,835	55,072	792,117	999,227
Bessener & Lake Erie.....	June 228	2,045,914	12,415	2,058,329	156,198	156,198	156,198	13,574	367,535	43,001	956,711	43,001	98,896	73,743
Bingham & Garfield.....	June 33	44,794	.....	44,794	5,568	5,568	5,568	86,327	1,839,983	208,677	4,650,876	208,677	1,861,967	2,029,198
Boston & Maine.....	June 2,169	2,366,811	275,681	2,642,492	42,718	42,718	42,718	9,918	29,428	5,072	29,428	5,072	25,263	17,167
Brooklyn Eastern Dist. Terminal.....	June 9	681,546	.....	681,546	78,021	78,021	78,021	2,786	267,549	38,343	443,966	38,343	46,540	42,859
Buffalo & Susquehanna R. R. Corp.....	June 253	94,840	2,232	97,072	102,276	102,276	102,276	10,772	34,462	8,241	110,472	8,241	28,749	24,767
Buffalo, Rochester & Pittsburgh.....	June 601	1,298,368	94,513	1,451,026	199,269	379,475	199,269	29,805	505,378	44,839	1,160,979	44,839	223,451	89,723
Canadian Pacific Lines in Maine.....	June 233	7,786,895	27,275	7,814,170	875,776	2,501,651	875,776	172,747	3,111,740	269,794	6,945,015	269,794	1,519,455	828,492
Central of Georgia.....	June 1,917	1,774,491	475,641	2,250,132	244,584	244,584	244,584	75,894	318,476	22,181	708,007	22,181	98,799	26,319
Central of New Jersey.....	June 690	4,284,393	793,404	5,077,797	1,100,225	1,100,225	1,100,225	46,107	1,904,322	118,495	3,786,290	118,495	1,087,533	3,995,668
Central Vermont.....	June 433	611,858	101,153	713,011	113,272	113,272	113,272	17,749	318,476	22,181	708,007	22,181	98,799	26,319
Chesapeake & Ohio.....	June 2,642	55,162,071	4,419,318	59,581,389	62,236,679	8,954,659	62,236,679	698,572	17,366,839	1,474,670	44,564,730	1,474,670	15,745,701	12,946,243
Chicago & Alton.....	June 1,055	1,808,139	601,278	2,409,417	434,634	434,634	434,634	75,090	879,812	62,128	2,010,354	62,128	356,056	307,814
Chicago & Alton.....	June 1,055	10,252,065	3,155,392	14,729,488	1,869,265	1,869,265	1,869,265	418,275	5,504,514	403,554	11,707,498	403,554	2,372,513	1,593,471

*Lap over figures. Included in Yazoo & Mississippi Valley from June 2, 1926.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1926—CONTINUED

Name of road	Average mileage operated during period.	Operating revenues			Maintenance of way and structures			Operating expenses			Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rents.	Net after 1925.
		Freight.	Passenger.	Total (inc. misc.)	Way and structures.	Equip-ment.	Traffic.	Trans- portation.	General.	Total.					
Chicago & Eastern Illinois.....	945	\$1,579,687	\$421,964	\$2,178,896	\$312,146	\$627,345	\$78,875	\$786,483	\$78,220	\$1,900,102	87.2	\$278,794	\$132,935	\$13,396	\$40,767
Chicago & Eastern Illinois.....	6 mos.	9,951,485	2,236,664	13,228,246	1,880,156	3,984,735	467,415	5,091,576	426,601	11,449,498	86.6	1,778,748	1,059,576	289,434	307,409
Chicago & North Western.....	8,457	10,058,422	2,640,419	12,698,841	1,998,906	2,693,507	231,362	4,759,977	348,869	10,118,835	71.1	4,107,039	3,305,976	3,098,190	2,291,662
Chicago & North Western.....	6 mos.	51,316,174	13,038,474	72,552,705	9,806,565	15,670,543	1,149,718	28,179,065	2,046,661	57,237,493	78.9	15,279,212	10,462,571	9,801,361	6,951,641
Chicago, Burlington & Quincy.....	9,404	9,254,079	2,221,571	12,777,532	2,411,555	2,137,604	301,428	4,217,228	364,617	9,349,167	73.2	3,428,365	2,508,408	2,214,665	2,352,037
Chicago, Burlington & Quincy.....	6 mos.	55,635,482	11,249,599	74,598,661	10,047,216	15,662,290	1,501,737	26,154,731	2,127,007	55,810,366	74.8	18,788,295	13,318,925	11,979,906	9,519,473
Chicago Great Western.....	1,496	1,726,582	293,233	2,170,078	405,324	407,635	85,533	763,810	57,288	1,730,364	79.7	439,714	360,226	210,331	24,747
Chicago Great Western.....	6 mos.	9,172,586	1,602,363	11,676,871	1,634,448	2,370,747	448,708	4,226,353	345,667	9,595,232	82.2	2,081,639	1,584,103	814,577	229,930
Chicago, Indianapolis & Louisville.....	647	1,119,071	243,700	1,521,416	163,071	340,300	38,734	507,888	33,614	1,099,172	72.2	422,245	337,521	240,502	177,909
Chicago, Indianapolis & Louisville.....	6 mos.	6,742,350	1,342,763	8,085,113	832,600	2,026,865	216,056	3,226,748	209,258	6,602,157	73.8	2,339,394	1,859,908	1,251,015	1,118,925
Chicago, Milwaukee & St. Paul.....	11,192	10,536,558	1,848,497	13,385,055	2,721,707	2,870,432	256,482	4,803,762	343,292	11,063,074	80.0	2,767,204	2,015,801	1,680,823	1,910,663
Chicago, Milwaukee & St. Paul.....	6 mos.	58,061,639	9,434,065	75,260,203	11,201,933	18,739,632	1,399,966	28,919,760	2,026,198	62,614,579	83.2	12,645,624	8,130,163	6,171,467	3,142,656
Chicago, Peoria & St. Louis.....	130	20,292	1,929	28,541	7,430	2,916	869	12,291	5,158	28,664	100.4	—123	—3,323	—4,670	—16,927
Chicago, Peoria & St. Louis.....	6 mos.	186	259,816	40,072	335,885	66,949	58,006	33,513	172,791	40,536	102.3	—7,629	—23,268	—91,503	—117,018
Chicago River & Indiana.....	19	.....	.....	.....	58,586	77,946	744	1,307,796	17,777	37,345	64.1	200,731	153,688	259,012	214,497
Chicago River & Indiana.....	6 mos.	.....	.....	.....	3,328,747	46,145	4,912	1,307,796	108,012	2,215,419	56.6	1,113,328	861,339	1,524,111	1,380,732
Chicago, Rock Island & Pacific.....	7,563	7,999,445	1,997,980	10,980,151	1,268,857	2,137,288	221,877	3,823,259	311,665	7,819,372	71.2	3,160,779	2,562,799	2,087,305	1,159,200
Chicago, Rock Island & Pacific.....	6 mos.	43,422,604	10,957,353	59,754,464	7,547,681	13,896,588	1,371,957	23,367,224	1,843,869	48,357,285	80.9	11,397,179	7,836,833	5,527,409	4,950,522
Chicago, Rock Island & Gulf.....	458	438,844	99,601	577,364	56,367	64,194	22,392	197,157	16,664	360,084	62.4	217,280	199,210	171,498	35,075
Chicago, Rock Island & Gulf.....	6 mos.	2,247,487	461,938	2,979,859	398,310	447,263	117,217	1,233,534	97,820	2,309,322	77.5	670,537	561,933	430,626	364,263
Chic., St. Paul, Minn. & Omaha.....	1,841	1,539,840	444,953	2,185,269	403,336	418,191	38,326	856,383	75,862	1,793,968	82.1	391,301	288,681	244,797	194,485
Chic., St. Paul, Minn. & Omaha.....	6 mos.	8,411	9,141,634	2,399,091	12,516,758	1,775,883	2,444,387	213,105	553,161	10,471,710	83.7	2,042,588	1,375,498	1,088,322	1,055,844
Cincinnati, Indianapolis & Western.....	347	355,112	28,622	410,834	87,033	89,991	16,356	152,188	17,954	263,488	88.5	47,346	28,846	—5,871	18,756
Cincinnati, Indianapolis & Western.....	6 mos.	2,022,099	150,023	2,321,710	310,344	516,706	95,124	946,460	118,260	1,990,379	95.7	331,331	222,886	19,993	92,857
Clinchfield Railroad.....	309	580,490	24,080	614,262	88,842	155,701	22,379	123,549	20,394	409,915	66.7	204,347	144,347	232,532	221,432
Clinchfield Railroad.....	6 mos.	3,099	3,750,211	155,728	3,984,745	400,782	1,095,263	135,869	803,304	2,550,094	64.0	1,434,651	1,074,549	1,635,270	1,621,590
Colorado & Southern.....	1,056	759,777	122,758	972,819	169,740	208,701	18,024	341,547	43,755	789,690	81.2	183,129	119,434	123,919	74,500
Colorado & Southern.....	6 mos.	4,616,034	650,703	5,804,578	761,483	1,382,533	37,391	2,176,929	257,626	4,695,891	81.0	1,104,987	722,231	638,516	421,191
Ft. Worth & Denver City.....	491	671,486	223,637	960,944	117,905	170,491	21,110	294,163	38,506	660,606	68.8	299,438	211,262	225,505	158,892
Ft. Worth & Denver City.....	6 mos.	4,097,450	1,079,206	5,577,220	536,350	773,701	102,461	1,766,831	228,427	3,743,179	67.1	1,832,698	1,476,148	1,439,765	1,266,490
Wichita Valley.....	271	540,467	107,415	647,882	16,618	16,618	91	245,442	1,811	61,079	65.1	324,269	23,977	8,737	17,836
Wichita Valley.....	6 mos.	.....	.....	.....	93,839	50,115	91	245,442	11,341	400,662	57.7	294,269	237,453	124,595	128,737
Columbus & Greenville.....	167	115,546	18,960	142,786	32,923	19,858	3,014	50,087	9,972	115,651	81.0	27,135	25,636	10,437	—13,553
Columbus & Greenville.....	6 mos.	712,182	136,802	904,938	236,088	108,951	17,939	334,082	62,182	760,912	84.1	144,026	135,254	38,161	—58,273
Delaware & Hudson.....	881	3,712,602	269,804	4,233,363	466,242	295,102	50,169	1,263,738	144,870	2,902,342	68.6	1,331,023	1,242,569	1,258,427	1,032,097
Delaware & Hudson.....	6 mos.	18,336,033	1,590,167	21,137,418	2,495,558	5,363,138	293,044	7,511,762	851,890	16,600,497	78.5	4,536,921	4,007,393	3,775,068	3,974,394
Delaware, Lackawanna & Western.....	999	6,073,283	1,095,870	8,063,326	792,928	1,419,326	136,872	2,675,389	189,590	5,274,392	65.4	2,788,934	2,052,971	2,110,644	1,739,982
Delaware, Lackawanna & Western.....	6 mos.	30,331,313	6,195,310	41,528,058	3,774,184	8,066,606	764,230	16,161,422	1,063,268	30,150,229	72.6	11,378,429	7,721,190	7,998,569	7,864,526
Denver & Rio Grande Western.....	2,571	2,066,598	437,810	2,728,780	547,048	490,607	53,533	799,391	90,408	1,978,520	75.2	750,260	560,184	643,619	502,311
Denver & Rio Grande Western.....	6 mos.	12,011,806	1,982,831	15,106,886	2,794,375	2,918,923	331,634	4,598,029	527,719	11,355,346	75.2	3,751,540	2,629,987	2,972,343	2,295,554
Denver & Salt Lake.....	255	219,037	26,466	245,503	163,421	100,624	1,745	59,494	7,217	326,443	121.6	—58,037	—64,037	—60,679	—15,438
Denver & Salt Lake.....	6 mos.	1,462,989	150,082	1,743,501	605,323	602,414	9,742	439,754	41,688	1,686,377	96.8	57,124	21,117	35,594	58,663
Detroit & Mackinac.....	375	108,893	16,985	125,878	140,181	33,150	1,783	48,284	5,452	133,709	88.2	16,472	6,710	15,037	5,653
Detroit & Mackinac.....	6 mos.	537,091	129,862	742,097	131,071	226,232	11,350	298,551	32,457	699,599	94.3	42,498	—11,830	34,921	69,473
Detroit & Toledo Shore Line.....	50	356,838	.....	356,838	359,703	51,845	3,207	78,037	9,449	177,273	49.3	182,430	158,954	82,805	18,742
Detroit & Toledo Shore Line.....	6 mos.	2,389,411	.....	2,389,411	2,412,786	275,140	19,846	619,650	52,579	1,179,442	43.9	1,233,344	1,092,004	548,585	242,824
Detroit Terminal.....	26	.....	.....	.....	210,853	14,652	.....	101,801	3,857	175,005	79.9	35,850	21,464	25,089	64,917
Detroit Terminal.....	6 mos.	.....	.....	.....	1,299,701	243,514	.....	673,958	21,682	1,038,704	79.9	260,997	167,690	190,085	357,009
Detroit, Toledo & Ironton.....	486	1,115,035	9,467	1,124,502	203,603	208,286	11,148	305,584	33,495	745,443	65.3	395,626	329,548	220,610	264,075
Detroit, Toledo & Ironton.....	6 mos.	6,570,168	59,246	6,707,748	976,931	1,259,074	65,963	1,890,636	207,179	4,364,467	65.1	2,343,281	1,935,472	1,293,678	1,768,286
Duluth & Iron Range.....	275	902,731	4,778	907,509	134,253	121,924	1,528	213,553	27,181	498,457	48.8	534,104	462,302	465,945	365,564

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1926—CONTINUED

Name of road	Average mileage operated during period	Operating revenues			Maintenance of way and structures			Operating expenses			Net from railway operation	Operating income (or loss)	Net after taxes, 1925
		Freight	Passenger	Total	Way and structures	Equip.	Total	Traffic	Trans.	General			
Chicago & Erie.....	269	\$956,891	\$78,338	\$1,035,229	\$151,294	\$138,238	\$289,532	\$23,533	\$349,202	\$40,320	\$701,773	\$382,620	\$949,619
Chicago & Erie.....	6 mos.	6,174,694	334,016	6,508,710	754,086	861,707	1,615,793	143,269	2,293,159	246,283	4,288,317	2,404,074	433,560
New Jersey & New York.....	45	30,593	101,909	132,502	16,347	19,698	36,045	1,735	66,473	4,111	108,644	26,129	6,810
New Jersey & New York.....	6 mos.	174,354	576,906	751,260	95,775	134,896	230,671	8,945	424,017	25,538	689,169	72,683	116,434
N. Y. Susquehanna & Western.....	135	363,014	50,548	413,562	67,887	67,369	135,256	4,746	185,071	12,901	327,964	105,696	92,250
N. Y. Susquehanna & Western.....	6 mos.	1,867,839	305,336	2,173,175	313,785	363,311	677,096	26,881	1,183,753	73,133	1,960,778	334,365	253,459
Evansville, Indianapolis & Terre Haute.....	146	184,674	4,360	189,034	35,734	27,446	63,180	1,955	63,260	6,722	135,137	35,515	14,966
Evansville, Indianapolis & Terre Haute.....	6 mos.	1,172,333	34,120	1,206,453	159,463	193,790	353,253	12,025	425,308	39,031	826,983	88,475	171,080
Florida East Coast.....	849	1,187,196	530,389	1,717,585	316,265	328,638	644,903	26,247	739,142	51,105	1,265,433	543,404	350,863
Florida East Coast.....	6 mos.	9,991,297	5,618,764	15,610,061	2,532,437	2,474,787	5,007,224	198,432	6,569,060	312,050	11,871,953	4,909,928	3,352,096
Fort Smith & Western.....	249	103,852	11,852	115,704	27,321	28,600	55,921	44,306	69,600	7,352	112,750	91,2	1,566
Fort Smith & Western.....	6 mos.	662,508	80,787	743,295	159,238	165,922	325,160	33,347	280,404	45,100	682,375	74,558	10,101
Galveston Wharf.....	13	.....	.....	.....	42,390	5,091	47,481	1,123	26,944	3,113	82,865	-6,236	-6,039
Galveston Wharf.....	6 mos.	.....	.....	.....	599,624	31,045	630,669	8,219	168,341	18,339	485,117	8,482	7,961
Georgia R. R.....	328	370,305	87,681	457,986	37,323	96,952	134,275	24,379	200,759	23,309	403,074	88,197	133,798
Georgia R. R.....	6 mos.	2,327,998	496,575	2,824,573	321,934	614,631	936,565	135,234	1,250,723	133,104	2,456,321	565,198	504,298
Georgia & Florida.....	436	116,049	20,536	136,585	15,636	16,991	32,627	7,794	56,662	7,381	104,085	31,519	14,947
Georgia & Florida.....	6 mos.	750,871	130,119	880,990	116,510	105,788	222,298	49,616	363,125	46,874	683,448	217,273	101,591
Grand Trunk Western.....	347	1,620,256	205,721	1,825,977	294,530	369,915	664,445	39,064	553,779	37,989	1,329,717	505,253	366,131
Grand Trunk Western.....	6 mos.	8,519,259	972,674	9,491,933	988,426	2,440,914	2,429,340	220,781	3,347,386	346,028	7,288,610	2,254,212	1,632,320
Atlantic & St. Lawrence.....	166	180,815	35,391	216,206	54,298	33,947	88,245	5,953	97,919	9,029	202,310	21,040	34,165
Atlantic & St. Lawrence.....	6 mos.	1,027,029	189,205	1,216,234	171,720	198,440	370,160	31,703	665,663	51,364	1,147,207	85,343	296,893
Chic., Det. & Canada Gr. Tr. Inc.....	59	243,988	2,928	246,916	17,151	17,151	34,302	4,303	160,677	3,540	160,677	118,431	81,626
Chic., Det. & Canada Gr. Tr. Inc.....	6 mos.	1,389,852	19,621	1,409,473	203,575	111,943	315,518	24,547	606,601	23,978	968,729	856,824	655,618
Det., Grand Haven & Milwaukee.....	189	580,273	35,506	615,779	75,297	58,143	133,440	12,241	262,243	16,440	424,288	241,586	122,884
Det., Grand Haven & Milwaukee.....	6 mos.	3,095,285	199,812	3,295,097	362,129	327,853	690,000	65,226	1,000,750	92,590	2,289,965	1,281,086	722,341
Great Northern.....	8,200	7,422,632	1,202,086	8,624,718	1,443,882	1,443,882	2,887,764	244,668	2,813,110	233,810	6,610,748	2,670,909	2,008,518
Great Northern.....	6 mos.	36,567,967	5,921,517	42,489,484	7,670,830	7,670,830	15,341,660	1,330,749	16,810,912	1,309,848	36,007,601	6,711,700	7,022,942
Green Bay & Western.....	234	112,619	5,513	118,132	29,656	25,169	54,825	4,416	43,131	2,298	104,636	9,385	7,093
Green Bay & Western.....	6 mos.	740,537	49,723	790,260	140,371	136,921	277,292	28,499	309,888	18,135	610,034	150,599	144,840
Gulf & Ship Island.....	307	218,911	46,736	265,647	21,825	64,529	86,354	5,006	109,311	4,428	166,320	140,8	26,889
Gulf & Ship Island.....	6 mos.	1,340,410	278,770	1,619,180	1,006,339	396,358	1,402,697	30,414	800,674	39,833	2,293,383	-373,792	-383,071
Gulf, Mobile & Northern.....	466	444,763	26,886	471,649	85,523	81,744	167,267	29,316	141,061	26,465	364,322	86,120	84,527
Gulf, Mobile & Northern.....	6 mos.	2,726,092	185,536	2,911,628	484,232	483,406	967,638	148,984	855,400	139,320	2,127,272	635,068	586,220
Hocking Valley.....	348	1,641,589	63,783	1,705,372	426,963	426,963	853,926	14,863	516,718	41,276	1,267,539	591,870	504,160
Hocking Valley.....	6 mos.	8,476,194	380,355	8,856,549	2,464,560	2,464,560	4,929,100	90,662	2,850,809	245,693	6,727,270	2,194,575	2,046,637
Illinois Central.....	4,874	9,760,567	2,027,634	11,788,201	2,006,955	3,032,898	5,039,853	278,447	4,217,489	324,848	9,934,900	1,932,671	1,900,007
Illinois Central.....	6 mos.	58,501,371	12,185,617	70,686,988	10,473,891	17,487,488	27,961,379	1,520,378	27,161,308	2,001,997	59,201,605	12,219,745	12,354,463
Yazoo & Mississippi Valley.....	1,099	1,788,867	343,916	2,132,783	433,604	433,604	867,208	48,756	859,126	92,458	1,862,672	221,254	154,617
Yazoo & Mississippi Valley.....	6 mos.	9,359,416	1,684,232	11,043,648	2,106,587	2,221,512	4,328,100	219,059	4,468,254	359,743	9,348,416	1,559,692	1,181,569
Illinois Central Combined.....	6,585	11,545,064	2,369,959	13,915,023	2,451,222	3,478,976	5,930,198	528,298	5,090,349	418,314	11,847,179	2,121,650	2,022,414
Illinois Central Combined.....	6 mos.	70,028,729	14,389,356	84,418,085	20,608,882	20,608,882	41,217,764	1,852,208	32,783,897	2,528,348	71,272,111	13,909,575	13,608,828
Kansas City, Mexico & Orient.....	272	135,202	8,000	143,202	41,270	40,860	82,130	7,873	76,956	7,861	117,105	-7,815	2,938
Kansas City, Mexico & Orient.....	6 mos.	792,474	40,662	833,136	223,457	246,725	470,182	41,787	389,472	43,259	945,776	-80,729	19,497
Kans. City, Mex. & Orient of Tex.....	465	240,471	20,690	261,161	74,117	45,699	119,816	8,633	101,929	7,836	218,205	37,438	18,10
Kans. City, Mex. & Orient of Tex.....	6 mos.	1,464,844	130,723	1,595,567	373,855	343,202	717,057	46,181	536,838	43,494	1,348,704	260,063	36,780
Kansas City Southern.....	784	7,122,116	722,193	7,844,309	1,019,067	1,560,297	2,579,364	304,385	2,967,551	468,411	6,309,998	367,692	308,939
Kansas City Southern.....	6 mos.	41,116,536	3,128	41,119,664	433,128	477,740	910,868	56,452	430,865	11,877	1,489,572	2,361,868	2,081,878
Texarkana & Ft. Smith.....	81	231,919	11,408	243,327	34,634	34,634	68,268	6,172	70,920	10,032	145,575	97,253	58,078
Texarkana & Ft. Smith.....	6 mos.	1,335,371	63,389	1,398,760	144,516	144,516	289,032	37,010	411,406	61,108	786,550	609,982	422,063
Kansas, Oklahoma & Gulf.....	314	170,337	4,569	174,906	19,214	19,214	38,428	8,647	63,903	6,328	170,030	94,6	11,468
Kansas, Oklahoma & Gulf.....	6 mos.	1,116,536	31,228	1,147,764	433,128	477,740	910,868	56,452	430,865	11,877	1,489,572	2,361,868	2,081,878
Lake Superior & Ishpeming.....	160	265,144	1,672	266,816	45,199	45,199	90,398	493	62,505	4,704	136,211	161,591	160,007
Lake Superior & Ishpeming.....	6 mos.	707,209	25,792	732,999	197,509	197,509	395,018	3,016	259,031	29,104	637,146	106,908	85,797
Lake Terminal.....	13	.....	.....	.....	18,660	18,660	37,320	.....	.....	1,866	95,888	21,867	12,183
Lake Terminal.....	6 mos.	.....	.....	.....	76,077	108,566	184,643	.....	321,623	10,353	516,591	888	7,870
Lehigh & Hudson River.....	96	283,158	1,736	284,894	39,040	37,315	76,355	1,913	104,073	12,829	195,164	89,160	63,841
Lehigh & Hudson River.....	6 mos.	1,464,206	13,017	1,477,223	151,547	200,588	352,135	11,377	609,321	72,884	1,033,910	467,885	316,711
Lehigh & New England.....	219	586,910	1,167	588,077	63,363	105,294	168,657	5,788	150,149	1,456	331,044	195,055	187,533
Lehigh & New England.....	6 mos.	2,406,450	8,128	2,414,578	274,454	561,584	835,038	30,614	787,299	99,831	1,732,409	588,774	627,472

*Includes Alabama & Vicksburg; Shreveport & Pacific from June 2, 1926.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1926—CONTINUED

Name of road	Average mileage operated during period	Operating revenues			Operating expenses			Operating ratio	Net from railway operation	Operating income (or loss)	Net after rents	Net after rents, 1925
		Freight	Passenger	Total (inc. misc.)	Maintenance of way and structures	Equip- ment	Traffic					
Lehigh Valley	1,363	\$6,237,751	\$696,826	\$7,444,658	\$837,995	\$1,624,410	\$139,998	70.9	\$2,166,467	\$1,736,430	\$1,639,568	\$1,666,420
6 mos.	1,363	31,031,866	3,697,372	37,419,866	4,070,776	8,057,758	762,935	77.4	8,445,477	6,479,440	5,645,090	6,924,431
Louisiana & Arkansas	302	300,035	17,732	328,257	63,081	62,232	11,481	75.3	80,968	48,516	37,758	57,909
6 mos.	302	1,903,318	112,449	2,072,720	305,712	354,849	68,495	67.3	678,678	471,341	376,822	342,070
Louisiana Ry. & Navigation Co., June 337	337	297,185	22,675	338,493	49,061	31,129	11,593	67.7	109,239	87,107	52,767	33,638
6 mos.	337	1,518,086	108,211	1,727,280	348,094	288,122	67,981	77.2	210,149	77,200	120,468	22,858
Louisiana Ry. & Nav. Co. of Texas, June 206	206	80,315	5,664	91,446	14,900	18,882	2,901	99.3	670	73,344	21,556	27,710
6 mos.	206	559,956	34,157	627,044	111,656	101,691	308,788	92.0	49,953	25,879	92,232	87,289
Louisville & Nashville	5,038	9,553,975	1,937,889	12,159,857	1,793,967	2,743,217	258,489	75.0	3,040,483	2,362,153	2,433,178	2,172,222
6 mos.	5,038	57,265,839	11,146,815	72,414,217	10,121,760	16,500,850	1,762,828	76.9	16,728,297	13,082,767	12,900,646	11,136,020
Louisville, Henderson & St. Louis, June 199	199	219,120	52,973	286,344	42,640	45,510	7,842	84.0	46,387	31,619	26,881	44,135
6 mos.	199	1,455,604	314,828	1,868,132	831,600	283,166	62,125	76.8	433,598	325,175	282,263	384,921
Maine Central	1,121	1,203,286	334,718	1,713,208	305,851	286,133	16,401	75.2	424,411	322,206	319,997	310,946
6 mos.	1,121	7,261,170	1,898,680	10,070,367	1,596,795	1,949,631	81,180	79.7	2,047,012	1,450,218	1,367,809	1,530,290
Midland Valley	364	320,139	29,921	359,986	73,118	36,272	6,953	60.8	141,170	120,795	104,390	75,415
6 mos.	364	1,811,962	184,228	2,071,060	323,993	219,339	38,558	58.9	850,297	741,877	634,670	514,214
Minneapolis & St. Louis	1,627	993,535	92,561	1,150,425	242,230	272,451	37,456	96.9	35,344	25,174	47,116	64,747
6 mos.	1,627	5,882,395	574,931	6,843,459	1,396,508	1,647,923	218,477	98.0	134,544	245,615	400,839	507,879
Minn., St. Paul & S. S. Marie, June 364	364	3,199,504	573,048	4,157,730	665,897	771,279	76,152	76.3	987,450	757,494	639,995	654,975
6 mos.	364	16,916,294	2,875,363	21,606,410	3,185,845	4,448,765	443,485	81.8	3,934,494	2,537,640	2,004,561	2,116,791
Duluth, South Shore & Atlantic, June 590	590	345,097	61,815	458,158	136,009	80,819	5,592	92.6	33,955	4,955	10,092	24,441
6 mos.	590	1,940,516	445,014	2,593,052	479,778	475,934	40,789	83.8	420,701	246,701	136,349	238,607
Spokane International	165	89,928	10,282	106,988	17,768	8,232	3,465	63.6	38,965	33,585	25,389	20,412
6 mos.	165	497,552	63,042	598,367	80,972	46,742	20,222	64.2	214,411	182,140	144,009	97,361
Mississippi Central	161	113,561	9,170	127,344	25,238	26,381	8,640	81.0	24,193	15,562	24,497	30,077
6 mos.	161	697,326	58,017	782,373	155,141	155,141	46,767	74.1	202,619	145,388	184,168	184,672
Missouri & North Arkansas, June 364	364	115,187	15,857	141,090	28,423	28,423	9,143	103.5	4,594	7,265	19,161	4,404
6 mos.	364	685,363	92,182	829,905	159,109	159,109	50,718	105.1	42,577	56,570	127,450	7,583
Missouri-Kansas-Texas	1,799	2,252,785	420,785	2,858,268	305,731	712,675	69,460	66.1	968,149	769,588	777,827	933,687
6 mos.	1,799	12,829,799	2,266,743	16,296,449	1,597,509	3,980,187	367,301	60.7	5,419,134	4,177,426	4,394,656	4,841,247
Missouri-Kansas-Texas of Texas, June 1,389	1,389	1,130,230	377,601	1,642,035	210,287	210,287	50,983	80.8	315,766	262,556	110,337	79,947
6 mos.	1,389	6,821,844	2,001,895	9,671,838	1,560,101	1,313,408	399,473	78.2	2,107,716	1,785,982	792,097	783,601
Missouri Pacific	7,347	8,410,765	1,334,921	10,578,179	1,706,975	2,227,546	367,741	78.0	2,329,628	1,881,988	1,466,796	1,348,555
6 mos.	7,347	51,003,132	7,755,671	63,722,196	9,587,867	13,487,403	2,162,109	78.1	13,946,157	11,212,682	8,725,790	7,251,588
Gulf Coast Lines	922	1,053,429	174,886	1,293,988	216,427	230,558	37,781	68.6	413,564	347,717	284,267	348,091
6 mos.	922	6,568,542	1,082,044	8,141,502	1,318,535	1,313,572	235,304	67.1	2,675,959	2,285,289	1,803,642	2,170,652
International Great Northern, June 1,159	1,159	1,155,299	222,132	1,496,584	283,193	235,171	31,940	77.23	340,842	289,686	214,435	96,749
6 mos.	1,159	6,590,254	1,186,374	8,546,824	1,536,208	1,435,698	194,533	81.96	1,550,219	1,286,978	791,159	757,123
Texas Pacific	1,953	2,017,337	519,981	2,755,937	454,644	507,554	99,318	76.9	637,057	473,213	414,307	344,062
6 mos.	1,953	12,408,454	2,899,286	16,641,544	2,719,228	3,242,682	407,391	79.1	3,472,184	2,531,740	2,038,412	1,975,925
Mobile & Ohio	1,161	1,388,185	109,719	1,572,223	249,057	295,173	53,312	74.5	401,221	285,839	256,076	215,508
6 mos.	1,161	8,516,803	677,347	9,688,717	1,365,264	1,832,371	308,826	73.4	2,578,784	1,962,089	1,674,367	1,503,990
Monongahela	130	484,141	18,839	507,159	65,500	65,000	1,020	50.1	25,114	224,934	159,841	131,577
6 mos.	130	3,005,608	135,623	3,182,652	375,000	390,000	6,540	54.4	1,451,361	1,305,437	846,592	619,448
Monongahela Connecting	7	.....	.....	175,021	19,296	32,076	395	73.2	46,844	37,603	33,324	16,296
6 mos.	7	.....	.....	1,125,414	111,525	208,958	2,268	75.3	272,725	234,895	221,787	135,942
Montour	57	103,577	413	104,578	27,334	48,729	1,202	97.4	2,746	2,590	31,121	15,976
6 mos.	57	396,431	1,746	401,924	113,263	235,568	7,522	122.1	88,662	104,670	84,225	150,877
Nashville Chatt. & St. Louis, June 1,259	1,259	1,320,349	372,589	1,837,009	295,647	419,143	74,450	83.0	313,045	237,838	227,483	130,553
6 mos.	1,259	8,785,243	2,295,380	11,932,464	1,928,585	2,683,571	432,065	81.0	2,264,718	1,813,643	1,715,544	1,406,469
Nevada Northern	165	75,492	8,012	90,872	10,351	5,037	870	40.8	53,805	45,031	44,396	29,534
6 mos.	165	378,458	48,147	468,220	73,744	34,689	89,589	49.7	235,698	176,445	182,520	161,373
Newburgh & South Shore, June 7	7	.....	.....	171,127	36,422	39,918	.....	85.0	25,593	12,095	13,816	29,051
6 mos.	7	.....	.....	999,984	117,815	247,152	.....	81.5	185,256	105,172	125,370	200,438
New Orleans Great Northern, June 274	274	233,161	27,630	258,974	33,063	57,377	6,977	70.0	77,706	58,413	47,548	25,809
6 mos.	274	1,327,224	153,267	1,576,793	182,874	307,909	42,221	68.5	480,736	366,320	286,836	218,733
New York Central, June 6,930	6,930	21,347,742	9,410,340	35,201,264	4,754,160	6,763,763	418,819	69.9	10,588,086	8,070,116	7,650,498	7,141,743
6 mos.	6,930	120,573,582	47,408,089	192,331,582	23,683,577	42,580,830	2,367,980	75.3	47,531,406	34,179,099	33,546,897	30,546,897
Cincinnati Northern	244	380,290	6,777	397,670	50,498	67,161	5,651	64.4	141,742	116,533	76,701	89,596
6 mos.	244	2,203,649	39,654	2,287,818	253,903	402,550	35,072	66.2	69,071	622,504	447,159	417,756

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1926—CONTINUED

Name of road	Average mileage operated during period	Operating revenues			Operating expenses			Operating ratio	Net from railway operation	Operating income (or loss)	Net after rents	Net after rents, 1925
		Freight	Passenger	Total	Maintenance of way and structures	Equip-ment	Traffic					
Cleve., Cin., Chicago & St. Louis, June 2,391	\$5,830,699	\$1,515,420	\$8,004,951	\$1,060,328	\$1,655,140	\$137,864	\$2,602,636	72.5	\$2,197,407	\$1,715,565	\$1,580,923	\$1,411,059
6 mos. 2,391	33,624,498	7,863,505	45,327,808	4,989,533	9,747,747	779,940	16,436,690	75.2	11,253,908	8,546,071	8,011,815	8,011,815
Indiana Harbor Belt, June 116	953,472	109,551	105,997	109,551	105,997	4,457	370,335	64.7	336,687	283,488	198,106	167,116
6 mos. 116	5,441,333	589,169	729,440	589,169	729,440	28,896	2,397,635	72.1	1,518,947	1,247,704	931,862	782,933
Michigan Central, June 1,871	5,677,276	2,151,993	8,631,105	1,112,681	1,245,245	113,930	2,497,233	64.0	3,110,993	2,533,945	2,386,238	2,445,486
6 mos. 1,871	32,619,293	10,249,883	47,482,732	5,068,783	9,083,976	671,956	15,167,111	67.5	15,415,478	12,369,328	11,630,966	10,679,117
Pittsburgh & Lake Erie, June 2,311	2,332,816	2,369,899	2,671,018	385,613	903,336	22,185	839,819	83.8	431,581	287,681	639,181	571,310
6 mos. 2,311	14,121,044	14,244,613	16,130,916	2,192,010	5,192,637	146,584	5,219,614	82.2	2,878,360	1,842,815	4,136,630	4,309,897
New York, Chicago & St. Louis, June 1,691	3,979,403	210,597	4,345,518	702,557	890,940	122,506	1,495,600	77.6	922,234	721,155	516,710	733,743
6 mos. 1,691	25,194,888	887,642	26,974,107	3,367,925	5,290,676	733,782	9,376,782	72.8	7,362,527	5,816,442	4,890,648	4,969,301
New York, New Haven & Hartford, June 1,918	6,052,313	4,255,579	11,605,928	1,913,457	2,533,727	79,327	3,817,764	74.6	2,596,172	2,486,630	1,922,771	1,914,462
6 mos. 1,918	35,546,086	24,084,787	65,128,066	8,098,458	13,592,902	452,938	23,103,204	74.7	16,469,024	13,771,163	10,759,068	10,759,068
Central New England, June 2,779	669,278	2,566	693,011	134,632	116,238	6,598	219,156	71.2	199,822	173,137	135,574	123,099
6 mos. 2,779	3,523,296	21,952	3,657,653	601,718	598,053	40,172	1,239,605	70.5	1,079,154	918,706	671,891	796,651
New York Connecting, June 20	183,236	.....	216,149	29,250	14,031	.....	50,108	43.8	121,398	82,598	89,242	77,746
6 mos. 20	1,122,357	.....	1,355,107	136,451	77,590	.....	309,209	39.3	822,868	593,268	578,517	592,079
New York, Ontario & Western, June 569	993,773	199,258	1,398,098	187,104	254,611	16,401	520,436	72.8	379,860	329,853	264,886	235,379
6 mos. 569	4,173,222	736,605	5,927,292	725,125	1,281,672	95,615	2,644,359	81.8	963,171	662,981	361,514	297,013
Norfolk & Western, June 2,241	8,949,335	641,185	9,892,756	1,466,013	1,680,782	109,543	2,380,770	59.9	3,964,767	3,140,417	3,395,985	2,721,773
6 mos. 2,241	48,985,484	3,636,830	54,564,563	7,493,255	10,405,670	644,522	14,406,753	62.4	20,517,024	15,935,208	17,638,998	12,348,426
Norfolk Southern, June 931	813,355	74,564	930,764	111,377	126,069	25,133	323,218	65.0	325,060	268,131	212,476	62,185
6 mos. 931	4,293,220	407,095	4,956,083	628,354	713,311	146,398	1,829,923	69.6	1,508,027	1,208,653	946,149	609,178
Northern Pacific, June 6,682	6,093,044	1,407,492	8,329,469	1,423,641	1,466,400	226,625	2,756,262	71.6	2,203,044	1,914,336	1,746,115	1,282,702
6 mos. 6,682	34,175,056	5,969,350	44,038,420	7,080,945	8,767,986	1,336,763	15,723,336	78.9	9,501,457	5,196,113	7,525,531	5,342,158
Northwestern Pacific, June 493	383,994	199,164	6-0-858	82,470	84,536	7,097	225,862	65.1	223,428	182,411	166,602	143,931
6 mos. 493	1,854,533	953,581	3,102,784	377,696	491,526	39,456	1,268,946	80.1	617,127	370,375	312,037	197,955
Pennsylvania R. R., June 10,518	41,252,854	12,613,818	59,364,630	7,330,084	13,546,163	770,483	20,355,155	74.9	14,885,913	11,450,348	10,022,235	8,596,024
6 mos. 10,518	235,953,756	70,646,380	356,815,499	44,641,979	80,869,129	4,233,773	125,788,333	80.0	67,506,611	52,275,020	44,022,706	38,022,976
Baltimore, Chesapeake & Atlantic, June 130	85,658	36,708	130,406	21,161	54,703	2,827	181,980	126.1	34,079	39,190	37,969	13,586
6 mos. 130	410,711	149,041	596,643	70,779	241,717	10,330	443,667	131.9	190,568	202,760	207,007	187,561
Long Island, June 397	1,057,732	2,380,051	3,669,087	468,732	549,122	34,719	1,352,807	68.3	1,163,383	881,653	599,181	848,115
6 mos. 397	5,504,498	11,398,054	18,204,141	2,673,707	3,170,797	168,780	7,976,979	79.7	3,693,403	2,897,398	1,821,988	2,301,879
West Jersey & Seashore, June 378	459,900	580,896	1,089,795	124,270	160,789	21,359	454,756	80.9	202,754	80,336	53,173	182,169
6 mos. 378	2,438,877	3,027,465	5,720,178	212,535	912,375	96,241	2,655,348	88.1	692,904	417,568	221,769	502,283
Peoria & Pekin Union, June 19	19,627	1,879	14,460	99,907	151,477	1,133	58,349	81.6	24,687	24,687	24,687	24,687
6 mos. 19	128,822	15,273	87,051	99,338	84,457	5,316	370,636	69.7	265,554	161,554	314,125	257,548
Pere Marquette, June 2,243	3,150,068	333,105	3,737,120	606,389	748,583	57,498	1,204,620	72.7	1,020,712	814,171	729,407	588,688
6 mos. 2,243	18,206,401	1,838,620	21,444,338	2,199,647	4,501,917	328,525	7,531,201	71.8	6,083,137	4,850,179	4,137,313	3,172,217
Pittsburgh & Shawmut, June 102	139,129	2,140	143,675	22,075	40,721	1,681	37,153	75.9	34,673	34,489	42,174	12,404
6 mos. 102	776,815	5,613	814,771	107,842	257,231	8,518	223,955	78.5	175,181	174,147	242,866	102,199
Pittsburgh & West Virginia, June 92	374,017	5,472	412,329	70,379	91,081	8,115	71,155	65.8	140,871	85,521	172,450	163,333
6 mos. 92	2,182,352	36,267	2,429,136	230,705	538,632	48,123	468,027	60.8	933,283	644,791	1,119,197	923,579
Pittsburgh, Shawmut & Northern, June 210	172,256	2,507	179,193	42,261	31,881	1,600	59,285	78.6	38,244	35,233	22,097	11,159
6 mos. 210	882,229	18,347	922,885	164,447	206,768	10,435	346,004	82.5	161,045	142,869	85,903	106,313
Quincy, Omaha & Kansas City, June 249	69,542	12,049	89,535	38,338	14,969	832	34,431	102.2	2,007	2,473	10,182	18,108
6 mos. 249	297,853	96,710	441,171	176,034	92,517	5,066	209,620	111.0	57,153	29,126	105,385	127,800
Reading Company, June 1,138	7,043,742	780,916	8,219,290	1,389,146	1,875,392	93,279	2,769,986	77.0	1,891,253	1,461,048	1,549,879	1,715,528
6 mos. 1,138	40,484,749	4,694,509	47,359,487	6,781,866	10,693,483	460,555	17,185,771	70.5	11,497,636	8,475,739	9,380,869	9,522,257
Atlantic City, June 161	145,587	277,416	445,606	87,827	28,328	9,835	230,902	81.6	73,232	38,135	4,968	130,583
6 mos. 161	790,111	1,018,327	1,920,662	541,069	192,290	53,874	1,133,710	101.1	22,612	203,435	376,630	308,564
Perkiomen, June 41	116,629	4,907	125,080	18,351	6,463	112	45,937	57.9	125,707	45,822	40,374	48,486
6 mos. 41	625,106	28,636	673,988	62,404	38,127	649	279,381	57.5	286,712	242,739	211,222	201,397
Port Reading, June 19	139,934	.....	179,063	35,737	7,777	229	62,373	62.4	67,387	50,624	2,727	6,681
6 mos. 19	989,892	.....	1,284,166	146,272	50,679	1,374	466,125	53.1	602,615	505,821	109,998	37,188
Richmond, Fred'sburg & Falmac, June 117	617,705	323,713	1,122,983	136,013	192,121	9,095	376,603	69.8	335,065	273,274	213,205	202,528
6 mos. 117	3,144,625	2,521,508	6,884,694	588,364	1,071,417	52,437	2,224,899	63.7	2,497,405	2,016,830	1,681,057	1,641,548
Rtland, June 413	311,869	91,098	539,267	135,609	673,949	61,718	205,510	89.0	59,083	32,750	42,964	72,956
6 mos. 413	1,939,010	604,506	3,260,427	602,949	673,949	61,718	1,320,514	84.4	507,556	345,707	403,571	269,858
St. Louis-San Francisco, June 4,986	5,412,932	1,353,090	7,289,651	1,026,241	1,483,975	121,579	2,321,271	70.3	2,171,708	1,768,708	1,792,637	1,716,107
6 mos. 4,986	32,049,943	7,590,229	42,785,967	5,286,303	8,527,058	658,757	14,590,555	70.3	12,482,403	10,221,576	10,254,683	9,868,732
Ft. Worth & Rio Grande, June 233	70,319	15,364	95,701	28,798	20,658	3,615	52,991	116.1	15,389	19,538	27,363	17,673
6 mos. 233	465,904	90,951	615,806	142,648	121,990	20,358	317,189	103.0	43,302	43,302	91,898	67,005
St. Louis-San Francisco & Texas, June 137	126,973	12,121	144,894	35,662	42,814	1,483	54,010	87.2	18,586	16,216	8,009	4,200
6 mos. 137	771,884	72,160	890,507	144,053	148,746	406	332,685	77.8	199,712	163,277	40,574	88,227
St. Louis Southwestern, June 940	1,217,074	107,101	1,396,725	223,828	253,488	57,617	355,557	69.1	432,036	368,083	286,455	262,055
6 mos. 940	7,566,104	675,338	8,701,481	1,311,569	1,589,970	343,900	2,321,880	66.3	2,759,777	2,371,694	1,866,826	1,830,279
St. Louis Southwestern of Texas, June 807	474,605	58,967	580,300	150,901	126,469	27,042	245,822	99.8	1,191	32,449	23,995	21,027
6 mos. 807	2,783,331	341,888	3,413,418	1,043,736	774,255	148,584	1,464,334	106.4	219,921	792,594	53,656	21,232

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1926—CONTINUED

Name of road	Average mileage operated during period	Operating revenues			Operating expenses			Operating ratio	Net from railway operation	Operating income (or loss)	Net after rents, 1925.
		Freight	Passenger	Total (inc. misc.)	Maintenance of way and structures	Traffic	Trans- portation				
San Antonio, Uvalde & Gulf.....	June 318	\$140,673	\$22,109	\$171,321	\$19,446	\$3,387	\$68,326	71.4	\$48,988	\$45,222	\$2,377
San Antonio, Uvalde & Gulf.....	6 mos. 318	769,715	125,699	895,414	122,402	21,117	314,339	69.3	295,904	274,399	21,505
Seaboard Air Line.....	June 3,928	3,857,277	888,833	5,116,038	686,838	194,971	1,853,949	75.9	1,235,272	944,606	290,666
Seaboard Air Line.....	6 mos. 3,928	24,874,259	7,088,732	35,095,514	4,575,514	1,218,269	13,090,155	74.1	9,086,359	7,341,297	1,745,062
Southern Ry.....	June 6,790	8,971,253	2,667,546	12,660,248	1,716,835	254,339	4,095,081	68.2	4,024,106	3,135,117	888,989
Southern Ry.....	6 mos. 6,790	55,074,837	15,081,056	70,238,487	13,488,945	1,502,330	26,137,716	71.4	21,851,227	16,926,614	4,924,613
Alabama Great Southern.....	June 318	638,911	181,255	876,734	119,389	20,869	258,186	69.6	266,725	207,116	69,609
Alabama Great Southern.....	6 mos. 318	3,978,198	936,891	5,241,598	758,296	126,400	1,601,837	71.1	1,517,265	1,164,710	352,555
Cin., New Orleans & Tex. Pacific.....	June 338	1,416,382	340,135	1,863,370	237,973	42,429	503,247	66.5	624,383	508,402	115,981
Cin., New Orleans & Tex. Pacific.....	6 mos. 338	12,592,157	2,199,400	14,791,557	1,592,864	262,199	3,283,318	75.7	3,733,107	3,007,248	725,859
Georgia Southern & Florida.....	June 401	355,210	144,276	539,953	86,521	16,921	128,277	75.3	131,017	99,321	31,696
Georgia Southern & Florida.....	6 mos. 401	2,469,720	1,004,717	3,336,592	514,797	109,184	74,512	72.0	1,046,611	849,663	196,948
New Orleans & Northeastern.....	June 207	375,479	87,163	497,431	65,004	12,707	145,684	65.8	170,115	109,242	60,873
New Orleans & Northeastern.....	6 mos. 207	2,429,385	471,592	3,111,720	398,974	75,113	920,839	63.5	1,136,561	793,686	342,875
Northern Alabama.....	June 110	98,979	7,419	109,174	4,721	2,043	34,419	65.4	37,757	30,621	7,136
Northern Alabama.....	6 mos. 110	666,019	50,383	733,014	145,761	13,062	237,134	65.8	288,600	250,692	37,908
Southern Pacific.....	June 8,747	13,441,904	3,876,993	19,082,722	2,638,821	364,412	5,811,288	65.8	6,523,164	5,040,137	1,483,027
Southern Pacific.....	6 mos. 8,755	70,499,590	2,042,361	99,852,445	15,410,335	2,071,690	33,273,186	73.2	26,803,864	18,583,734	8,220,130
Atlantic Steamship Lines.....	June 874	631	54,636	1,105,887	19,246	18,645	652,402	83.6	181,756	172,495	9,261
Atlantic Steamship Lines.....	6 mos. 874	4,967,530	250,219	6,147,061	1,012,210	96,900	3,846,473	86.9	804,402	745,238	59,164
Galveston, Harrisburg & S. Antonio.....	June 2,104	1,784,878	439,038	2,395,290	447,908	55,417	805,723	82.0	431,371	373,440	57,931
Galveston, Harrisburg & S. Antonio.....	6 mos. 2,104	10,129,063	2,654,089	13,792,056	2,708,211	334,326	5,128,892	86.7	1,835,148	1,260,390	574,758
Houston & Texas Central.....	June 900	750,279	232,768	1,022,694	231,780	33,373	355,471	84.6	163,778	104,159	59,619
Houston & Texas Central.....	6 mos. 896	4,581,586	1,328,150	6,415,934	1,282,833	171,991	2,227,957	84.7	984,263	622,866	359,397
Houston East & West Texas.....	June 191	196,686	36,853	246,989	46,737	4,357	63,978	65.4	85,300	66,022	19,278
Houston East & West Texas.....	6 mos. 191	1,227,823	212,926	1,518,559	275,620	24,256	437,377	73.0	410,381	317,738	92,643
Louisiana Western.....	June 207	200,361	79,238	300,884	38,091	9,411	94,151	82.4	52,895	35,652	17,243
Louisiana Western.....	6 mos. 207	1,283,154	463,062	1,879,457	286,283	14,304	593,026	86.2	372,379	231,136	141,243
Morgan's L. & T. R. & S. Co. June.....	June 400	1,684,843	131,797	2,397,213	190,153	12,845	268,333	65.2	373,437	270,215	103,222
Morgan's L. & T. R. & S. Co. June.....	6 mos. 400	2,758,403	768,801	3,881,256	1,019,070	140,436	1,719,886	105.7	220,746	52,284	168,462
Texas & New Orleans.....	June 569	603,222	142,154	801,153	152,788	19,164	329,311	91.5	68,466	32,492	35,974
Texas & New Orleans.....	6 mos. 553	3,757,761	871,679	4,957,393	984,384	1,074,313	1,875,044	86.1	689,989	477,016	212,973
Spokane, Portland & Seattle.....	June 554	517,559	136,323	723,621	89,859	13,220	198,430	63.8	262,197	184,775	77,422
Spokane, Portland & Seattle.....	6 mos. 554	2,784,492	622,474	3,761,047	615,114	57,096	1,136,565	67.5	1,232,359	760,140	472,219
Tennessee Central.....	June 296	227,155	30,563	272,189	63,633	4,571	92,880	81.5	50,447	44,285	5,162
Tennessee Central.....	6 mos. 296	1,347,785	184,212	1,619,421	353,720	46,614	585,957	82.6	291,611	253,438	38,173
Terminal Railroad Ass'n of St. L. June.....	June 55	.....	1,073,652	195,516	88,841	2,119	386,936	65.2	373,437	270,215	103,222
Terminal Railroad Ass'n of St. L. June.....	6 mos. 55	.....	6,564,940	935,107	575,933	14,364	2,545,228	64.4	2,336,731	1,673,946	662,785
Toledo, Peoria & Western.....	June 248	97,104	15,623	122,907	29,010	2,008	65,041	109.0	11,021	18,741	7,720
Toledo, Peoria & Western.....	6 mos. 248	506,239	120,238	681,684	131,448	17,407	376,349	107.5	51,082	97,270	46,812
Trinity & Brazos Valley.....	June 367	113,988	9,614	129,284	43,967	5,035	70,760	144.9	58,039	65,760	7,269
Trinity & Brazos Valley.....	6 mos. 367	765,122	54,415	858,072	300,138	27,378	463,669	135.5	218,528	265,379	53,149
Ulster & Delaware.....	June 128	38,332	21,327	59,723	21,919	18,023	32,300	85.7	16,804	11,054	5,750
Ulster & Delaware.....	6 mos. 128	255,656	66,283	354,707	95,509	104,764	275,398	99.8	1,068	33,433	1,034
Union Railroad of Penna.....	June 45	.....	1,186,737	122,850	198,925	168	438,629	65.5	408,946	345,658	63,288
Union Railroad of Penna.....	6 mos. 45	.....	5,806,486	604,450	1,288,391	1,067	2,624,245	79.0	1,220,765	1,016,358	204,407
Union Pacific.....	June 3,691	6,202,070	1,662,119	8,800,110	1,379,307	223,905	2,316,192	72.8	2,395,110	1,684,053	711,057
Union Pacific.....	6 mos. 3,690	36,315,488	7,706,881	48,624,384	6,288,899	1,098,137	13,710,109	72.1	13,584,626	9,397,394	4,187,232
Oregon Short Line.....	June 2,537	2,211,633	459,297	2,928,985	545,387	63,857	824,741	71.8	825,312	569,004	256,308
Oregon Short Line.....	6 mos. 2,513	13,307,136	2,076,926	16,633,393	3,525,123	320,261	5,017,701	75.3	4,108,032	2,560,986	1,547,046
Oregon, Wash. R. R. & Nav. Co. June.....	June 2,237	2,066,616	395,924	2,727,166	455,367	83,679	856,928	70.3	809,829	638,371	171,458
Oregon, Wash. R. R. & Nav. Co. June.....	6 mos. 2,237	10,577,573	1,879,214	13,684,540	2,648,886	445,146	4,914,860	81.2	2,572,972	1,545,077	1,027,895
Los Angeles & Salt Lake.....	June 1,207	1,438,312	577,104	2,238,628	319,354	81,354	501,870	72.1	624,150	492,146	131,904
Los Angeles & Salt Lake.....	6 mos. 1,207	8,609,405	2,344,000	12,231,306	2,393,438	431,484	3,762,640	72.7	2,000,045	1,280,698	719,347
St. Joseph & Grand Island.....	June 258	215,218	15,023	230,163	5,802	3,965	24,212	81.8	48,570	29,478	19,092
St. Joseph & Grand Island.....	6 mos. 258	1,545,828	99,873	1,746,295	297,832	18,325	587,030	72.2	485,501	361,263	124,238
Utah.....	June 111	153,235	139	154,095	25,286	372	29,673	66.3	51,982	42,470	9,512
Utah.....	6 mos. 111	786,585	882	790,683	97,289	2,274	172,776	69.4	242,307	185,235	57,072
Virginian.....	June 545	1,637,145	48,718	1,815,670	233,935	13,245	364,169	54.3	828,947	696,744	132,203
Virginian.....	6 mos. 545	9,192,245	344,609	10,215,209	1,266,700	77,749	2,239,617	57.6	4,327,657	3,529,315	798,342
Wahash.....	June 2,524	4,489,037	876,610	5,788,503	987,015	156,910	2,087,666	77.8	1,283,141	1,030,329	252,812
Wahash.....	6 mos. 2,524	27,194,202	4,401,722	34,007,049	4,630,321	1,144,520	13,112,962	76.2	5,076,836	4,624,574	452,262
Western Maryland.....	June 804	1,660,152	43,614	1,765,816	287,540	342,386	477,591	67.2	579,269	490,269	88,999
Western Maryland.....	6 mos. 804	10,150,807	273,159	10,769,788	1,446,923	216,340	3,191,123	70.0	3,226,815	2,545,645	681,170
Western Pacific.....	June 1,042	1,062,577	229,283	1,390,604	216,485	46,091	300,228	67.8	444,895	336,507	108,388
Western Pacific.....	6 mos. 1,042	5,475,009	849,907	6,729,997	1,081,131	22,445	2,316,650	77.6	1,509,287	1,040,945	468,342
Wheeling & Lake Erie.....	June 511	1,688,644	38,356	1,842,267	396,677	32,410	497,546	71.4	1,881,666	1,272,829	608,837
Wheeling & Lake Erie.....	6 mos. 511	9,145,749	223,402	9,913,559	1,283,364	191,465	2,939,706	71.7	2,801,952	1,960,596	841,356

Traffic News

The Women's Traffic Club of Los Angeles (Cal.) held its regular meeting on Wednesday evening, August 4, with president Emma A. Kentz in the chair. The meeting was addressed by S. L. Kreider, who told of his recent trip to Japan.

The formal dedication of the new Gallatin Gateway of Yellowstone National Park, which is served by the Chicago, Milwaukee & St. Paul, was held on August 1, and attended by a large delegation of officers of the St. Paul and official representatives of western states.

Motor cars will replace steam passenger trains on the Springfield and Shawneetown branches, in Illinois, of the Baltimore & Ohio about September 15. Five new motor cars, built by the Electro-Motive Company, of Cleveland, will be put in service on these branches of 228 miles. The motor cars will seat 74 people. They will haul as trailers the regular baggage-postal cars.

The quantity of grain awaiting export at Montreal was reported on August 10, as 15,112,859 bushels; two-thirds of this amount being in the elevators and the remainder in the holds of 53 lake steamers, waiting to be unloaded. Slack demand from Europe is the occasion of the unusual congestion. Receipts of grain from the west continue to be heavier than last year.

The railroads terminating in Boston, Mass., have proposed that on grapes received from the west this year, the demurrage after three days shall be ten dollars a car; and the discussion of this proposition with the fruit dealers has aroused strong protests. Representatives of California shippers have, however, favored an increase, believing it necessary to hasten the movement of empty cars back to the Pacific Coast. The receivers declared that an increased rate would be a discrimination against Boston as compared with other cities and against grapes as compared with other fruit. It was stated that 5,242 cars of grapes were received in Boston last year. About three-fifths of this quantity was sold at auction after arrival.

B. & O. Appoints Traveling Chef

With a view to establishing and maintaining uniform excellence in the preparation of meals on its dining cars, the Baltimore & Ohio has created the new position of traveling chef. Joseph Press, cook on President Willard's car, has been selected to fill the position.

Owing to the nature of the duties of dining car chefs, scattered throughout the system, it is impracticable to call them together for instruction. At the same time the value of imparting information to them on niceties in cooking and of securing uniformity of food was recognized. The activities of the new supervisor is expected to secure this result.

Grain Rate Cut Arouses Opposition

The proposed reduction of six cents per 100 lb. in rates on grain and grain products moving via Minneapolis, Minn., to eastern points, as provided in tariffs filed by the Minneapolis & St. Louis, and the Minneapolis, St. Paul & Sault Ste. Marie, has aroused strong protest, and both the proponents and opponents of the reduction have prepared to go before the Interstate Commerce Commission. The Minneapolis & St. Louis proposes a six per cent reduction on grain moving via Minneapolis and the Peoria gateway to all points east of Buffalo and Pittsburgh. The Soo Line proposes a similar reduction in rates on grain moving via Minneapolis and Sault Ste. Marie to New England points only. The Soo Line is also prepared, according to F. R. Newman, vice-president in charge of traffic, to put in the reduced rates to all points east of Buffalo where the eastern lines agree to join with it, either through Sault Ste. Marie or any other Soo Line gateway.

Grain and milling interests at Minneapolis and vicinity supported by farm organizations and state commissions have organized in favor of the proposed reduction, the Minneapolis Traffic Association taking the lead in preparing petitions sup-

porting the move. Minneapolis shippers contend that Minneapolis has been at a disadvantage, as compared with Duluth, on account of the wide differential between rates on grain moving via Duluth and the Great Lakes to Buffalo and the east and the all-rail rate on grain and grain products moving via Minneapolis to the Atlantic seaboard. Opposing the reductions are the eastern trunk lines (in Official classification territory) and shippers of grain outside the Minneapolis district. The other western lines have not met the reduction. The new Minneapolis & St. Louis tariffs are to become effective August 25, and the Soo Line tariffs, September 2. The present controversy does not affect the three-cent reduction in grain rates recently put into effect by the western lines, with the approval of the Interstate Commerce Commission.

Motor Transport News

Governor Gifford Pinchot of Pennsylvania has referred to the attorney-general of the Commonwealth the applications of the Reading Transportation Company and the Pennsylvania General Transit Company for charters to do a highway transportation business in that state. The former company is the highway subsidiary of the Reading Railway and the latter the highway subsidiary of the Pennsylvania. The applications for charters for the two companies have been approved by the Public Service Commission.

F. J. Scarr, supervisor of motor service of the Pennsylvania, acting in behalf of the Pennsylvania General Transit Company, has commenced the operation of motor buses on the route from Chambersburg to Piney Mountain Inn. Announcement of the granting of the permit for this operation by the Pennsylvania State Public Service Commission was made in the *Railway Age* of July 17. The commission has granted authority to Mr. Scarr to operate trucks in freight service between Waynesburg and Washington, having denied that portion of the application which covered passenger service.

THE INTERSTATE COMMERCE COMMISSION has announced that the initial hearing in connection with its investigation of rates on petroleum and petroleum products will be held at St. Louis, Mo., on October 4 before Examiner J. B. Keeler.

EIGHTY LOCOMOTIVES will be built for the Spanish railways by the following Spanish companies: Maquinista Terrestre y Maritima, of Barcelona; Sociedad Euskalduna, and Sociedad Espanola Babcock & Wilcox, of Bilbao. Half of these locomotives are for the Norte Railway and half for the Madrid-Zaragoza-Alicante Railway.

A SURPLUS of 350,000,000 lire from Italian railway operations is expected for the current year, instead of 200,000,000 lire as first predicted, and for the coming year, 350,000,000 lire. As a result of the decree issued last October which sets aside funds for capital expenditures, the railway administration will have at its disposal about 2,500,000,000 lire, out of which the inadequacy of the present rolling stock will be made good.

THE DEPARTMENT of Public Utilities of Massachusetts, sitting as agent of the Interstate Commerce Commission, has rejected the petitions of the Boston & Maine for authority to abandon certain branch lines, and has sent its report to Washington. As to the branch from South Ashburnham to Ashburnham and the line between Bedford and North Billerica, the rejection is absolute. The Concord-Reformatory line may be abandoned only between Concord station and the Reformatory. The Essex branch may be abandoned only between Essex station and Conomo, one mile. This mile includes a long trestle.

THE INDIAN TARIFF BOARD has been asked to protect manufacturers of locomotives, the request coming from the Peninsular Locomotive Company, with works at Jamshedpur. Some time ago the Tariff Board turned down a similar request on the ground that requirements of Indian State Railways were not sufficient to keep work of this character going economically. The Peninsular company claims to have come into existence as a result of avowals by the Railway Board that the government's requirements would amount to about 400 locomotives a year, which figure has proved excessive.

Foreign Railway News

Joint Operation of Two French Railways Proposed

Operation of two of the principal French railway systems, the Paris-Orleans and the Southern, is said to be under consideration. Under the plan there would be no financial amalgamation of the two properties, but simply a unification of the operation and maintenance organizations.

Progress of Latvian Railway Operations in 1925

Gross receipts of the Latvian railways from freight and passenger traffic during 1925 amounted to \$6,494,960, as compared to \$6,345,770 in 1924, states a report to the Department of Commerce from Commercial Attache C. J. Mayer, Riga, Latvia. A total of 10,972,400 passengers were carried during the year, and 3,174,100 tons of freight were handled, compared to 2,203,782 tons in 1924.

The railways, which are state-owned, comprise 2,805 kilometers of track, and are equipped with 342 locomotives, 642 passenger cars, and 7,173 freight cars. Very little new rolling stock is in operation, and although there is critical need for new passenger coaches the government feels that it cannot grant an appropriation for this purpose.

Operating Results of South African Railways

The operating and financial results of the South African Government owned and operated railways for 1925 showed a material advancement, owing to the bumper corn crop and the generally flourishing state of business which prevailed in the agricultural, pastoral, and mining industries throughout the year, according to advices to the Department of Commerce from Assistant Trade Commissioner William L. Kilcoin, Johannesburg.

The number of passengers carried by the railways surpassed the preceding year by 5,336,106, and the tonnage of freight hauled totaled 20,865,987, a figure eclipsing all previous records and 2,305,434 in excess of 1924.

Gross earnings showed a gain of £1,810,751, totaling £23,573,151. Of this amount freight (other than coal) accounted for £12,218,390, passenger traffic for £5,290,063, coal for £4,057,783, parcels for £588,153, livestock for £596,500, other traffic for £143,160, and miscellaneous services for £687,102. As contrasted with this showing, however, operating and equipment expenditures advanced from £16,350,259 in 1924 to £18,508,058 in 1925, thus paring down the net surplus after payment of interest and other charges, to £804,928. The net surplus for 1924 was £1,433,177.

A total of 424 miles of new lines were opened to traffic during the year, bringing the mileage controlled by the Railways and Harbors Administration up to 12,607 at the end of December. Of this total 1,352 miles represent South West African lines and 684 private undertakings leased and operated by the Administration.

Connecting Link Standard Gauge

Line Begun in Australia

The beginning on June 23, of the work on the railway line from Kyogle (New South Wales) to Richmond Gap, on the Queensland border, which line will be linked later with another being built from South Brisbane, marks a definite advance towards a solution of one of the Commonwealth's greatest problems—varying railway gauges, according to advices to the Department of Commerce from Trade Commissioner Babbitt, Sydney, Australia.

When this work is completed within the time limit of three years it will be possible to travel from Sydney to Brisbane on standard gauge without the inconvenience of changing trains and the expense resulting from transshipment of freight will be avoided. The line also will traverse a region of agricultural wealth. The ultimate objective of the government is to have a continuous standard gauge to Perth (Western Australia).

The length of new line to be constructed in New South Wales

is only 27 miles, and in Queensland 70 miles, but there are 85 miles of the existing line between Grafton and Kyogle to be strengthened to make the line ready to carry heavier rolling stock. This line through the North Coast, via Casino and Kyogle, will then become the main express line between Sydney and Brisbane, and will save 5 hours and 20 minutes over the present journey, the saving of mileage being 117 miles.

The total cost of the work from Grafton to South Brisbane is estimated at £4,000,000, exclusive of £484,190, the amount of the lower of two bids for building a bridge across the Clarence at Grafton. The Commonwealth government is arranging the finance for the whole project.

Aleppo-Constantinople Sleeping

Car Service Established

Direct sleeping car service twice weekly between Aleppo, Syria and Constantinople and return was inaugurated recently by the Cilicia-North Syria Railroad, according to a report from Vice-Consul Alling, Aleppo, made public by the Department of Commerce. Previously such service was available only between Adana and Constantinople.

The new schedule furnishes 48-hour service between the two cities, reducing the time of the journey considerably. The trip from Paris to Aleppo can now be made in six or seven days, depending upon the connections at Constantinople and upon the train taken across Europe.

At present, the cost of the entire journey from Aleppo to Constantinople, including sleeping accommodations, is \$38.30 first class and \$29.31 second class.

Company Management for Belgian State Railways

The most interesting of the measures now being adopted by Belgium for the rehabilitation of the franc is, perhaps, says the Times (London) the turning over of the State Railways to a new company—La Société Nationale des Chemins de Fer—which is to operate them as a money-making concern. Apart from what the plan may do for Belgian finances, that journal continues, it has a wider general interest as being a confession, based on experience, of the incompetence of state management.

Belgium is densely populated. It has busy and prosperous industries. The country is generally flat, so that gradients are seldom bad and heavy train-loads can be hauled. For the last two years, at least, under the late M. Françoise, the railways have, on the technical and engineering side, been admirably handled. This is conceded by everybody. Yet the net result in last year's budget was a deficit of more than 95,000,000 francs. None the less, it is confidently predicted that under a "strong and independent industrial organization"—to quote the preamble of the new law, which has been unanimously adopted by the Senate—the railways can be made to pay, and their shares are being recommended by the government as a profitable investment.

It is, in the first place, obvious that the extent to which profits can be realized must depend on how far the new organization is really "strong and independent," how far it will be able to free itself from the incubus of political interference in the management. It is at the outset not very encouraging that the same section of the preamble states that this "strength and independence" of the company is to be combined with the "maintenance of the essential rights of control possessed by the state" and with "guarantees of their vested interests (*droits acquis*) to the numerous and loyal staff."

The state does not surrender the actual ownership of the properties, but only the rights of operation. The shareholders acquire no material security, but on its face the enterprise should be good—provided that there is vigorous management, unembarrassed by politics. The railways to be turned over comprise almost exactly 3,000 miles of main standard-gauge line (the narrow-gauge lines being already in a separate organization), which are laid with steel ranging from 80 lb. to 120 lb. to the meter. The standard henceforward is to be 110 lb. to the meter. The equipment includes 4,606 locomotives, 9,311 passenger coaches, with 1,649 baggage vans, and 122,789 freight cars. All, both permanent way and rolling stock, are believed to be in excellent condition.

In the year 1925, as compared with 1924, there was a marked improvement in both the tonnage and number of passengers carried per train mile. There was a fuel economy, on a ton-mile

basis, of 20 per cent, and a saving in material and supplies on the same basis of 12.5 per cent. An increased engine-mileage of 0.5 per cent was attained with a reduction of 3.8 per cent in enginemen, and of 6.6 per cent in trainmen. Other figures give the same evidence of competent technical management. It would not, therefore, seem safe to calculate on much further improvement in this direction. The reforms which are to bring the new profits must be looked for elsewhere.

A really independent management, with commercial considerations only to be taken into account, would undoubtedly turn first, for economies, to a reduction in the payroll, and next, for enlarged revenue, to an increase in tariffs. In tackling the payroll, we are immediately confronted with the political problem and those "guarantees of the vested interests" already referred to.

There are at present about 103,000 employees in the railway service, and that is obviously an excessive number for 3,000 miles of line. It is pleaded in excuse that there are some 4,500 war-wounded carried on the lists and the eight-hour law has compelled the employment of three shifts, in place of two, in many departments. Much more important, however, have been the great influence of labor in Belgian politics and the inherent vice of state management; and as it is announced that employees can only be discharged by the Minister of Railways himself, who remains the president of the administrative council, one is compelled to fear that economies in this direction can be attained, if at all, only very gradually.

The prospects of increased revenue from higher tariffs are more promising. It is true that in the past the volume of traffic—passenger travel, especially—has shown itself in Belgium extremely sensitive to any increase in charges. In part this is ascribed to the natural advantages of the railways—namely, the flatness of the country and density of the population. Roads are good and hauls generally short; and the competition of road-transport is consequently keen. An increase in charges very quickly diverts both passengers and the higher-priced and best-paying merchandise to the automobiles.

Nevertheless, Belgian tariffs are at present conspicuously low; passenger charges, in particular, even lower than they appear on the face of the schedules, because about two-thirds of the travel is on season tickets. They should undoubtedly stand raising, and a general increase of 10 per cent did, in fact, go into effect in June, another increase of 10 per cent being due in August, to be followed by a third similar increase in October.

Behind everything, however, threatening to nullify any changes in prices and upset all calculations, is the depreciated franc. The properties being turned over by the state have been valued at 11,000,000,000 francs (at a time when the franc stood a good deal higher than it does today) which is to be represented by 1,000,000,000 francs of ordinary shares to be retained by the state and 10,000,000,000 francs of preference shares to be offered in series at intervals, on terms which are not yet decided, but may vary with each series. It is anticipated that the first series will be an issue of 2,000,000,000 francs, to be offered primarily to holders of treasury notes, maturing in the near future. This issue will have a preferential dividend of about 2.70 per cent guaranteed by the state, after which all profits are to be shared equally between the preference and the ordinary shares. In regard to the guaranteed dividend it is anticipated that the state will, in order to increase the attractiveness of the issue, undertake its payment in francs bearing some fixed ratio to the gold franc, or to the pound sterling, or dollar.

The control of the new company will be in the hands of a Council of Administration of 21 members to be appointed by the Crown either on the ground of their "especial competence" or on the recommendation of various government departments, or on that of the directors of the sinking fund, with three members to be recommended by the employees of the company. It seems curious that no members are chosen directly by the subscribing shareholders, but as all the shares are turned over to the sinking fund and sold for its benefit it appears to be held that the five members recommended by the directors of that fund sufficiently represent the shareholding interest.

It is, however, impossible not to have some misgivings (especially in view of the provision already quoted from the preamble as to the "essential rights of control" of the state) as to how far the management, under a board constituted as this Council of Administration will be, can feel "strong and independent."

Equipment and Supplies

Locomotives

THE CANADIAN PACIFIC is inquiring for one snow plow.

THE MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE is inquiring for 10 Mountain type locomotives.

THE NEWFOUNDLAND RAILWAY has ordered one Pacific type locomotive from the Baldwin Locomotive Works and one from the American Locomotive Company.

THE KENTUCKY & INDIANA TERMINAL has ordered six eight-wheel switching locomotives from the Lima Locomotive Works. This company was reported in the *Railway Age* of April 3 as inquiring for 11 locomotives.

Freight Cars

THE PUBLIC BELT RAILWAY, New Orleans, La., is inquiring for 50 box cars.

THE CAMBRIA & INDIANA will have repairs made to 250 cars at the shops of the Greenville Steel Car Company.

THE PITTSBURGH CRUCIBLE STEEL COMPANY has ordered 5 special flat cars from the Standard Steel Car Company.

THE ST. LOUIS SOUTHWESTERN has ordered 10 steel underframes from the Mount Vernon Car Manufacturing Company.

THE HARTOL PRODUCTS COMPANY, Newark, N. J., has ordered 25 tank cars of 8,000-gal. capacity from the Shippers' Car Line Corporation.

THE INTERNATIONAL RAILWAYS OF CENTRAL AMERICA have ordered two flat cars of 20-tons' capacity from the Magor Car Corporation.

THE ATLANTIC COAST LINE has ordered 50 steel underframes for caboose cars from the Virginia Bridge & Iron Company. Twenty of the new underframes will be used for strengthening existing cars that have wooden frames; the remaining 30 will be used in constructing new caboose cars in the railroad company's shops. In the *Railway Age* of May 15 this company was reported as inquiring for 50 caboose cars.

Passenger Cars

THE UNION PACIFIC is inquiring for seven baggage cars equipped with sleeping quarters.

THE NEW YORK CENTRAL is inquiring for 40 coaches, 30 suburban cars, 5 combination passenger and baggage, 4 suburban combination passenger and baggage with an alternate on passenger, baggage and mail, 10, 60-ft. 6-in. baggage, 10, 69-ft. 3-in. baggage with an alternate on 70-ft. 1½-in. baggage, 5 combination baggage and mail and 20 milk cars.

Iron and Steel

THE NEW YORK CENTRAL has ordered 300 tons of fabricated steel for a passenger subway at Erie, Pa.

THE DELAWARE, LACKAWANNA & WESTERN has ordered about 20,000 tons of rail from the Bethlehem Steel Company.

THE ALABAMA GREAT SOUTHERN has ordered 300 tons of steel for use at Chattanooga, Tenn., from the Converse Bridge Company.

THE PACIFIC FRUIT EXPRESS has ordered 258 tons of structural steel for a shop building at Roseville, Cal., from Dyer Brothers.

THE NORFOLK & WESTERN has divided an order for 55,000 tons of rails between the Carnegie Steel Company and the Bethlehem Steel Company.

Machinery and Tools

THE ALABAMA GREAT SOUTHERN has ordered a driving wheel lathe from the Niles-Bement-Pond Company.

THE CHICAGO, BURLINGTON & QUINCY has bought a 36-in. throat single end punch from Joseph T. Ryerson & Son, Inc.

THE CHICAGO, BURLINGTON & QUINCY has ordered a Monarch helical lathe and a Defiance boring mill from Manning, Maxwell & Moore, Inc.

THE NEW YORK, NEW HAVEN & HARTFORD has ordered a Putnam journal turning and quartering lathe from Manning, Maxwell & Moore, Inc.

THE ILLINOIS CENTRAL has bought three lathes from Joseph T. Ryerson & Son, Inc. This company also ordered a radial drill from Manning, Maxwell & Moore, Inc.

Signaling

THE ELGIN, JOLIET & EASTERN has placed an order with the General Railway Signal Company covering 12 Model 5A switch machines to be applied to switches, Wharton derails and Hayes derails; materials to be shipped to Joliet, Ill.

THE PENNSYLVANIA has placed an order with the General Railway Signal Company for one 72-lever Model 2 unit lever type electric interlocking machine for installation, 58 working levers, at Ford street, Chicago, Ill., at the crossing of the Chicago & Eastern Illinois.

THE ATCHISON, TOPEKA & SANTA FE has placed an order with the General Railway Signal Company for one 4-lever electric interlocking machine at Argentine, Kans., with other material. This order also includes a steel cabinet for a 48-lever machine, seven semaphores and 11 switch layouts.

THE SEABOARD AIR LINE has placed a contract with the Union Switch & Signal Company covering the complete installation of automatic block signals between Savannah, Ga., and Jacksonville, Fla., and between Jacksonville and Baldwin, a total distance of 151.4 miles. The territory involved is single track and the APB system of control will be used. The installation will require 246 one-unit, three-position style "R" color light signals, and 24 two-unit style "R" light signals. Four existing interlocking plants in this territory will have the home signals changed from the existing type to the style "TR" color-light signals. Five drawbridge interlocking plants will be reconstructed, and new "S8" electro-mechanical machines will be installed in the towers. The home signals at these plants are to be style "TR" units, and smashboards will be used in connection with them. Desk circuit controllers will be installed at three locations in connection with two-lever ground mechanical machines for the operation of cut-off connection switches. At Baldwin there will be nine a.c. interlocking desk circuit controllers and 3 a.c. switch movements will be installed. Between Savannah and F. & J. Junction, near Jacksonville, approximately 129 miles, the trickle charge system will be used. The signaling from F. & J. Junction to Baldwin, approximately 22 miles, will be a.c. signaling with power furnished at each end through automatic switchboards. A 4400-volt power line will be built from Savannah to Jacksonville. In addition to furnishing current for the signaling system, the power line will be utilized for station lighting and other needs.

National Train Control on C. & A.

An item published in the *Railway Age* of July 31 stated that the Chicago & Alton had ordered certain signal materials from the General Railway Signal Company that were required on account of automatic train control installations. This item has created a wrong impression in some quarters, for although the signal materials ordered are to be used in train control territory, no train control materials were included in the order and the present system of train stop, that of the National Safety Appliance Company, now in service on the C. & A., is being extended.

Supply Trade News

The Timken Roller Bearing Company will construct an extension to its plant at Canton, Ohio, estimated to cost \$1,000,000.

H. G. Steinbrenner has been elected second vice-president of the Brown Hoisting Machinery Company, Cleveland, Ohio, and will have charge of the marketing of the company's products.

F. A. Whitten, formerly chief engineer of the General Motors Truck Company, Detroit, Mich., has been appointed engineer in charge of design and development of the American Car & Foundry Motors Company, Detroit.

Edgar S. Bloom, formerly a vice-president of the American Telephone & Telegraph Company, was elected president of the Western Electric Company on August 6, to succeed

Charles G. DuBois, who had been president for the past seven years and who continues as chairman of the board of directors. Mr. Bloom began his telephone career some thirty years ago with the New York Telephone Company. He was born in Bloomsbury, N. J., and graduated from the engineering department of the University of Pennsylvania in June, 1895. In July, after one year of post-graduate work, he entered the traffic department of the New York Telephone Company.



Edgar S. Bloom

From 1897 to 1906 he was construction engineer in New York, where he assisted in designing and putting into practical use the interior block system for large office buildings. From 1907 to 1909 he was plant superintendent of the New York & New Jersey Telephone Company for Long Island and later for New Jersey. In 1909 Mr. Bloom went to San Francisco as general plant superintendent for the Pacific Telephone & Telegraph Company, but returned later in the same year to New York to become plant superintendent for the State of New York outside New York City. In 1910, he had general supervision of plant operations in the United States for the American Telephone & Telegraph Company. Two years later he became operating vice-president of the Southwestern Bell Company. In 1914 he was appointed one of the receivers for the Central Union Telephone Company, serving until the termination of the receivership in 1919, when he was elected president of that company. Mr. Bloom became president of the Indiana and the Ohio Bell Telephone Companies in February, 1920, and later, chairman of the boards of directors of those companies. The following October he was elected vice-president of the Illinois Bell Telephone Company. He continued as an officer in those three companies until his election as a vice-president of the American Telephone & Telegraph Company early in 1922.

Obituary

William Lawton Manson, for many years New England agent at Boston, Mass., of the American Hoist & Derrick Company, St. Paul, Minn., died in Boston on August 7, at the age of 73.

Railway Construction

ATLANTIC COAST LINE.—A contract has been awarded to the Roberts & Schaefer Company, Chicago, for two electric cinder handling plants to be installed at High Springs, Fla., and Lakeland.

CANADIAN PACIFIC.—A contract has been awarded to Carter, Halls, Aldinger & Co., of Winnipeg, Man., for the construction of an addition to the Canadian Pacific hotel at Banff, Alta.

CENTRAL OF NEW JERSEY.—A contract has been awarded to Arthur E. Smith, Plainfield, N. J., for the construction of concrete abutments and a reinforced concrete deck of a new bridge at Martine avenue, Fanwood, N. J., to cost approximately \$26,180.

CHICAGO & WESTERN INDIANA.—The construction of an extensive layout of team tracks is under way, located at Twenty-sixth and Canal streets, Chicago, to cost approximately \$1,500,000.

CHICAGO, ROCK ISLAND & PACIFIC.—A contract has been awarded to the Roberts & Schaefer Company, Chicago, for three electric cinder handling plants to be installed at Valley Junction, Iowa.

CISCO & NORTHEASTERN.—This company has applied to the Interstate Commerce Commission for authority to extend its line from Breckenridge to Throckmorton, Tex., approximately 40 miles.

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS.—This company has awarded a contract to the McClintic-Marshall Company, Pittsburgh, for the erection of several bridges of a total weight of 1,100 tons at various locations.

DENVER & SALT LAKE.—A contract has been awarded to E. H. Honnen, Colorado Springs, Colo., for the construction of two miles of railway from the west portal of the Moffat tunnel to connect with the Denver & Salt Lake line.

GREAT NORTHERN.—The construction of the first unit of a 250-room hotel at Watertown Lake, B. C., north of Glacier Park, has begun.

GREAT NORTHERN.—The construction of a freight terminal at the south end of Lake Union, Seattle, Wash., at a cost of approximately \$750,000, has been authorized.

KANSAS CITY SOUTHERN.—Bids were closed on August 7 for the construction of a brick passenger station at Gentry, Ark., estimated to cost \$20,000.

LONG ISLAND.—This company, in an advertisement addressed to its patrons, definitely commits itself to the construction of a new suburban terminal at Diagonal street, Long Island City, in the event that agreement can be reached with the city authorities.

MINNEAPOLIS, NORTHFIELD & SOUTHERN.—A contract has been awarded to Nolan Brothers, Minneapolis, Minn., for the construction of six-mile extension from Luce Line Junction, Minn., to Robbinsdale, estimated to cost \$225,000.

MISSOURI-KANSAS-TEXAS.—C. N. Whitehead, president of this company, is reported to have announced that the construction of an extension from San Antonio, Tex., to the Texas-Mexican border, a distance of more than 100 miles, is contemplated.

MISSOURI-KANSAS-TEXAS.—A contract has been awarded to the Roberts & Schaefer Company, Chicago, for the construction of a 600-ton, three-track, reinforced concrete, automatic electric coaling station at Denison, Tex., and for the construction of a 200-ton station of the same type at Bartlesville, Okla.

MISSOURI PACIFIC.—A contract has been awarded to S. M. Bates & Co., Kansas City, Mo., for the construction of a station at Corning, Ark.

MISSOURI PACIFIC.—Bids will be received until August 16, for the construction of a two-story brick and concrete freight station, 40 ft. by 250 ft., at Coffeyville, Kan.

MISSOURI PACIFIC.—It is reported that bids will be received early next year for the construction of a union passenger station at Texarkana, Ark., to be built and used jointly by the Missouri Pacific, the Texas & Pacific, the St. Louis-Southwestern and the Kansas City Southern. The cost of the structure, in accordance with plans now being prepared, is estimated at approximately \$1,300,000.

NEW YORK CENTRAL.—A contract has been awarded to Bates & Rogers Construction Co., Chicago, for the construction of two viaducts over Grand boulevard, Miller, Ind. The contract is for the masonry work, all preliminary work having been completed by the railway.

NEW YORK, NEW HAVEN & HARTFORD.—This company has awarded contracts as follows:

Engine term, improve..New Bedford, Mass..	\$125,000	H. R. Kent & Co., Rutherford, N. J.	
Engine term, improve..Fall River, Mass....	95,000	McNally Const. Co., Fall River, Mass.	
Engine term, improve..Lowell, Mass.....	80,000	Tredennick-Billings Co., Boston, Mass.	
Coal pocket	Midway, Conn.....	50,000	Roberts & Schaefer Co., Chicago
Coal & cinder plant....	Lowell, Mass.....	30,000	Roberts & Schaefer Co., Chicago
Coal & cinder plant....	Fall River, Mass....	34,000	Roberts & Schaefer Co., Chicago
Metal building	New Haven, Conn...	30,000	Truscon Steel Co.
Metal building	East Hartford, Conn.	40,000	Truscon Steel Co.

The company closed bids on August 3 for engine terminal improvements at Greenbush, Mass., estimated to cost \$70,000, and on August 7 for a shop extension at New Haven, to cost approximately \$150,000.

OWENSBORO, ROCKPORT & CHICAGO.—The Interstate Commerce Commission has denied the application of this company for authority to construct a line from Owensboro, Ky., to Elnora, Ind., a distance of 84 miles.

PENNSYLVANIA.—Plans are being prepared for the construction of a passenger station at Gary, Ind., estimated to cost \$100,000.

PENNSYLVANIA.—This company has awarded contracts totaling approximately \$357,000, as follows:

Nature of work	Location	Probable cost	Firm to which contract was awarded
Masonry in connection with reconstruction of bridge over Pine creek.	Clairton, Pa.	\$25,000	M. J. McMenamin, Philadelphia.
Erection of 5 overhead bridges in conn. with second track work.	Pierron to St. Jacob, Ill., and Casey to Montrose, Ill.	37,000	Seaboard Construction Co., Philadelphia.
Constr. of viaduct over tracks to eliminate grade crossing.	Red Bank, O.....	65,000	Hodges Construction Co., Cincinnati.
Constr. of 30-ft. slab bridge, 8-ft. pedestrian tunnel and masonry for 60 ft. half through girder bridge, to eliminate 4 grade crossings.	Manor, Pa.	230,000	John F. Casey Co., Pittsburgh.

SALT LAKE & DENVER.—The Interstate Commerce Commission has assigned this company's application for authority to build a line from Craig, Colo., to Provo, Utah, for oral argument before Division 4 at Washington on September 21.

WARRIOR RIVER TERMINAL.—This company, which has recently been authorized by the Interstate Commerce Commission to acquire a line from Ensley Junction, Ala. (near Birmingham), to Birmingham on the Warrior river, has now received authority to construct 0.13 miles of line and acquire trackage rights over the Birmingham Southern to give it a new mileage of 3.58.

Railway Financial News

BALTIMORE & OHIO.—Asks Authority for Direct Operation.—This company has applied to the Interstate Commerce Commission for authority to operate directly, under an operating agreement, the lines of the Dayton & Union, the Hamilton Belt and the Indian Creek Valley, which it now controls.

CENTRAL OF GEORGIA.—Bonds.—The Interstate Commerce Commission has authorized the authentication and delivery of \$5,394,000 of refunding and general mortgage 5 per cent bonds, to be pledged as collateral for short term notes.

DENVER & RIO GRANDE.—Suit of Minority Stockholders Dismissed.—Justice George V. Mullan of the Supreme Court has dismissed the suit brought by George Tracy Rogers and other minority stockholders of the Denver & Rio Grande Railway against the estate of George J. Gould, Edward T. Jeffrey and other officers of the defunct railway for an accounting of \$200,000,000 on the ground that the railroad became insolvent through their acts and has awarded the defendants, judgments for costs ranging from \$119 to \$125. Justice Mullan found that the defendants did not act collusively or in conspiracy, or enter into any unlawful combination to wreck the Denver & Rio Grande or to cause the property to be wiped out or destroyed or to be absorbed by other interests.

EL PASO & SOUTHWESTERN.—Tentative Valuation.—The Interstate Commerce Commission has issued a tentative valuation report as of 1917, covering the properties of the El Paso & Southwestern Company and of its leased lines, the Dawson, the El Paso & Rock Island, the El Paso & Northeastern and the Alamogordo & Sacramento Mountain, but not including the Texas lines, which are included in another report. The final value of the property owned and used for carrier purposes was placed at \$4,277,000 and that of the used property at \$16,602,863.

GULF PORTS TERMINAL.—Abandonment.—The Interstate Commerce Commission has issued a certificate authorizing the Gulf Ports Terminal to abandon its line from Pensacola, Fla., to Pamona, Ala., 31.3 miles, and from Parker, Ala., to Muskogee, 11.42 miles, which includes the entire railroad except the company's Pensacola terminals. This authorization is issued on the condition that the company, within 30 days from the date of the certificate, shall sell its railroad as a whole to anybody desiring to purchase it for continued operation at a price not less than \$200,000. It was shown in the record that the Louisville & Nashville desires to acquire the terminal properties to secure access to present and prospective industrial developments in the western part of Pensacola, but is unwilling to acquire the terminal properties if the acquisition carries any obligation to operate the remaining lines.

INTERNATIONAL-GREAT NORTHERN.—Bonds.—The Interstate Commerce Commission has granted authority to this company to procure authentication and delivery of \$9,943,000 first mortgage 5 per cent bonds, series B, \$6,000,000 thereof to be sold at not less than 92¾ to Kuhn, Loeb & Co. and \$3,943,000 to be pledged as collateral security for short term notes.

LOUISVILLE & NASHVILLE.—Control of Cumberland & Manchester.—The Interstate Commerce Commission has approved the acquisition by the Louisville & Nashville of control of the Cumberland & Manchester by the purchase of its capital stock and by lease. The acquired property was completed in 1917 and extends from a connection with the Louisville & Nashville at Hiedrick, Ky., to Manchester, 22.99 miles and a branch to Sibert, 2.6 miles. Its traffic is chiefly coal. The commission was convinced that the acquisition of the new subsidiary by the Louisville & Nashville would make possible the development of the territory which it serves; would result in economies of operation and tend to reduce certain rates.

MINNEAPOLIS & ST. LOUIS.—1925 Earnings.—The annual report for 1925, recently issued, shows a deficit after fixed charges of \$1,905,210 as compared with a deficit in 1924 of \$2,996,391. Selected items from the income statement follow:

	1925	1924	Increase or Decrease
Gross operating revenues	\$15,074,273	\$15,097,126	—\$ 22,853
Operating expenses	13,220,168	14,546,992	— 1,326,824
Taxes (other than U. S. Gov.)	760,834	727,716	33,118
Total	\$13,981,001	\$15,274,708	—\$1,293,707
Operating revenues over expenses and taxes	1,093,272	177,582	— 1,270,854
Other income	16,651	155,085	— 138,434
Interest on outstanding funded debt	2,055,160	2,079,994	— 24,834
Total fixed and other charges	3,015,132	2,973,894	— 41,238
Balance—Deficit	1,905,210	2,996,391	— 1,091,181

MINNEAPOLIS, NORTHFIELD & SOUTHERN.—Bonds.—The Interstate Commerce Commission has authorized the issuance of \$1,200,000 first mortgage bonds, series A. The company had proposed to sell the bonds to the Minnesota Loan & Trust Company at not less than 93 per cent of par but the commission authorized the sale at not less than 95. The proceeds are to be used to finance the cost of contemplated capital expenditures as well as to reimburse the company for expenditures previously made.

MISSOURI PACIFIC.—Bonds.—This company has applied to the Interstate Commerce Commission for authority to procure the authentication and delivery of \$22,094,000 of first and refunding mortgage 5 per cent bonds, partly against 6 per cent bonds of another series now held in its treasury, and partly against \$11,670,000 of expenditures for additions and betterments made and to be made in 1926. The company also asked authority to pledge and repledge the bonds from time to time as collateral security for short-term notes.

NEW ORLEANS, TEXAS & MEXICO.—Bonds.—This company has been authorized by the Interstate Commerce Commission to issue \$4,600,000 of first mortgage 5 per cent bonds, to be sold at not less than 97½.

SEABOARD AIR LINE.—Bonds.—This company has been authorized by the Interstate Commerce Commission to sell \$8,000,000 of first and consolidated mortgage 6 per cent bonds at not less than 93. The commission has also granted authority for the issuance of \$422,000 first and consolidated mortgage bonds, series A, to be pledged as collateral security for short term notes.

TAMPA & JACKSONVILLE.—Sold.—The properties of this company were sold at a special masters' sale on August 2 to H. A. Smith of Hartford, Conn., and F. J. Lisman of New York, as a committee of bond holders, at a price of \$300,000.

Dividends Declared

Canadian Pacific.—Common, 2½ per cent, quarterly; preferred, 2 per cent, semi-annually; both payable October 1 to holders of record September 1.
 Maine Central.—Preferred, 1½ per cent, quarterly, payable September 1 to holders of record August 16.
 New Orleans, Texas & Mexico.—\$1.75, quarterly, payable September 1 to holders of record August 16.

Average Price of Stocks and Bonds

	Aug. 10	Last Week	Last Year
Average price of 20 representative railway stocks	97.89	98.40	84.64
Average price of 20 representative railway bonds	97.21	96.83	90.41

Valuation Reports

The Interstate Commerce Commission has issued final or tentative valuation reports, stating the final value for rate-making purposes of the property owned and used for common-carrier purposes, as of the respective valuation dates, as follows:

FINAL REPORTS		
Green Bay & Western	\$7,264,197	1916
Christie & Eastern	141,520	1919
Portland & Southwestern	330,616	1917
Carlton & Coast	348,603	1917
Sainte Marie Union Depot Co.	175,560	1916
Belt Line	205,000	1917
TENTATIVE REPORTS		
Kane & Elk	\$100,000	1918
Kentucky & Tennessee	683,448	1918
Delaware Valley	190,000	1919
Oklahoma City Junction	156,089	1919
Port Huron Southern	66,000	1919

Railway Officers

Executive

T. M. Schumacher, chairman of the executive committee of the Western Pacific, has been elected also a director member of the executive committee and managing committee of the Denver & Rio Grande Western, succeeding **E. N. Brown**.

Operating

C. J. Curtin has been appointed acting chief supervising agent of the New York Central and the Ottawa & New York, with headquarters at Syracuse, N. Y.

R. V. Reamer, engineer maintenance of way, of the Central of New Jersey, has been promoted to division superintendent of the Lehigh & Susquehanna division, with headquarters at Mauch Chunk, Pa.

J. L. Brown, superintendent of transportation of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, has been given the title general superintendent of transportation, with the same headquarters.

Edward S. Moore, who has been promoted to general superintendent of transportation of the Norfolk & Western, with headquarters at Roanoke, Va., was born on September 28, 1880, at Newport, Pa. He was educated in the public schools and entered railway service in 1896 as a messenger for the Norfolk & Western at East Radford, Va. Two years later he became a stenographer in the office of the car service agent of that road and, in 1903, was appointed chief clerk to the superintendent of transportation at Roanoke. In July, 1917, he was promoted to superintendent of transportation and held that position until his recent appointment as general superintendent of transportation, succeeding **D. E. Spangler**, who died on July 22.

Earl B. Moffatt, who has been promoted to general superintendent of the Delaware, Lackawanna & Western, with headquarters at Scranton, Pa., was born at Dunmore, Pa., on June 29, 1890. He entered railway service with the Delaware, Lackawanna & Western on February 15, 1906, as a clerk and stenographer in the car service department and since that date has been continuously in the service of the Lackawanna. In September, 1908, he became stenographer and secretary to the superintendent of the Morris & Essex division and in December, 1910, was promoted to chief clerk to the assistant general superintendent. In January, 1912, he became assistant chief clerk to the general superintendent and remained in that capacity until March, 1917, when he became chief clerk to the vice-president and general manager. In March of the following year he was promoted to assistant to the federal manager and upon the return of the roads to their owners on March 1, 1920, he became assistant to the vice-president and general manager, with headquarters at New York. In this position he remained until the time of his recent promotion.



E. S. Moore

Traffic

W. A. Marshall has been appointed assistant general freight agent of the Seaboard Air Line, with headquarters at Norfolk, Va.

Howard F. Fritch, president of the Boston & Maine Transportation Company, has been appointed passenger traffic manager of the Boston & Maine Railroad.

John H. Dunphy has been appointed general passenger agent of the Pere Marquette, with headquarters at Detroit, Mich., succeeding **W. E. Wolfenden**, deceased.

George E. Schnitzer, general freight agent of the Chicago, Rock Island & Pacific, with headquarters at Little Rock, Ark., has resigned to engage in other business.

George B. Rice, who has been appointed assistant freight traffic manager of the Seaboard Air Line, with headquarters at Norfolk, Va., was born on January 19, 1885, at Tappahannock, Va. He entered railroad service in December, 1901, with the Southern. In 1904 he went with the Seaboard Air Line as file clerk in the general freight office and two years later became file and rate clerk in the general freight office of the Atlantic Coast Line. From the latter part of 1907 until May, 1908, he was rate clerk in the general freight office of the Georgia Southern & Florida. He then went to the Atlanta, Birmingham & Atlantic in a similar capacity for a few months, and in October of the same year returned to the Southern in the same capacity. From 1909 to 1911 he was a rate clerk in the traffic department of the Carolina, Clinchfield & Ohio. In the latter year he went to the general freight office of the Seaboard Air Line in the same capacity and remained there until March 1, 1920, when he was promoted to assistant chief clerk to the first vice-president. In September, 1922, he was appointed assistant to the first vice-president and held that position until his recent appointment as assistant freight traffic manager.

Mechanical

John W. McVey, until recently general superintendent of motive power of the Consolidated Railroads of Cuba, has been appointed research engineer in the mechanical department of the Boston & Maine, with headquarters at Boston, Mass. In his new position Mr. McVey will be concerned with general research activities, with the object of securing increased efficiency, and of studying the application of suggestions advanced by employees.

Engineering, Maintenance of Way and Signaling

S. L. Mapes has been promoted to engineer, maintenance of way, of the Central of New Jersey, succeeding **R. V. Reamer**, promoted, with headquarters at Jersey City, N. J.

A. Chinn, roadmaster on the Chicago, Burlington & Quincy, with headquarters at Kansas City, Mo., has been promoted to assistant engineer maintenance of way, with jurisdiction over the Wyoming district, with headquarters at Alliance, Nebr., succeeding **T. P. O'Neill**, transferred.

Purchases and Stores

C. E. Swanson has been appointed storekeeper of the Chicago, Burlington & Quincy, with headquarters at Plattsmouth, Neb., succeeding **W. F. Huneke**, who has been assigned to other duties.

Obituary

John H. Tonge, manager of the Washington Terminal Company, died at his home in Washington, D. C., on August 6.

George W. Green, industrial commissioner of the St. Louis-San Francisco, with headquarters at St. Louis, Mo., was killed in an automobile accident near Menominee, Mich., on August 7.